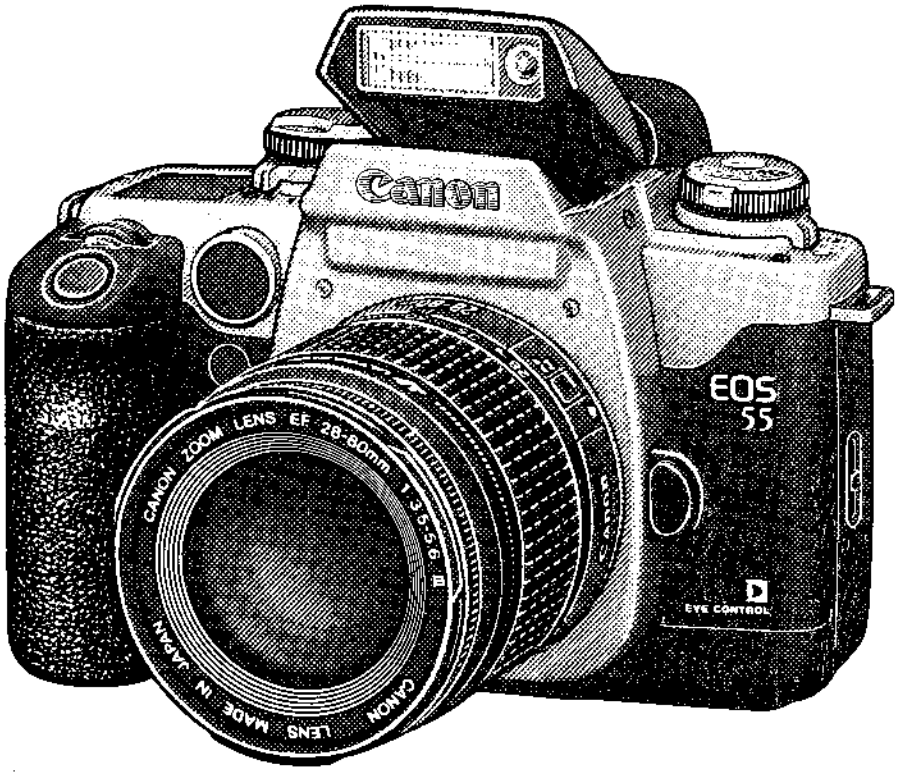
Canon

Service Manual

ENGLISH EDITION

EOS 55	**C12-8281**
EOS ELAN II E / QD	**C12-8283, 84**
EOS 50 E / QD	**C12-8286, 87**
EOS ELAN II / QD	**C12-8293, 94**
EOS 50 / QD	**C12-8296, 97**



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SERVICE MANUAL

Application

This manual has been issued by Canon Inc. for qualified persons to learn technical theory, and repair of products. This manual covers all localities where the products are sold. For this reason, there may be information in this manual that does not apply to your locality.

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First published September, 1995
Publisher:Osamu Ohkubo (Photo Products Quality Assurance Div.)
Editor (Japanese): Kiminori Igari (Camera Technical Support Department)
Editor (English): Harley Ferguson (Camera Technical Support Department)
Production: ABE Corporation

This manual was produced on an Apple Macintosh™ II ci personal computer and OKI MICROLINE 801PS+F laser beam printer; block copies were printed on MICROLINE 803PSII+F.
A Canon mo-5001S Magneto-Optical Storage Subsystem with mo-502M Magneto-Optical Storage Disk Cartridge and mo-IF2 interface kit were used for storing large volumes of page layout and graphic data for this manual.
Graphics were produced with either Aldus Free Hand™ 3.1 or Adobe Illustrator® 5.0.
All documents and all page layouts were created with QuarkXPress™ 3.3E.

PREFACE

1. SERVICE MANUAL COMPOSITION

This manual contains information on servicing the product. It has the following sections.

Part 1 General Information

Provides the basic information needed to understand the product.
(Operating instructions are not included. Refer to the product's instruction book if necessary.)

Part 2 Technical Information

Provides technical information about the mechanism and electronics of the product.

Part 3 Repair Information

Provides information for disassembly, reassembly, and adjustment of the product, about the tools required, and about the adhesives and lubricants required, and their application.

Part 4 Parts Catalog

Part 5 Electrical Diagrams

2. MODEL DIFFERENCES

At time od going to press there are x different models with various combinations of features. This table showws the combinations.

Market Area	Model Name	Features		
		Eye-control AF	Date Printing	Panorama
Japan	EOS 55	✔	✔	✔
North America	EOS ELAN II E	✘	✘	✘
	EOS ELAN II E QD	✔	✔	✘
	EOS ELAN II	✘	✘	✘
	EOS ELAN II QD	✘	✔	✘
Europe, General Export	EOS 50 E	✘	✔	✘
	EOS 50 E QD	✔	✔	✘
	EOS 50	✘	✘	✘
	EOS 50 QD	✘	✔	✘

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Part 1

General Information

1. FEATURES

N: Indicates a new feature first found in this EOS camera.
◘: Indicates a feature of cameras having Eye-Controlled Autofocus.

1. High-Performance Eye-Controlled Three-point Autofocus

N ● Eye-Controlled Autofocus operates with wide-area three-point AF with the camera held either for horizontal or vertical framing .

✓ Wide-area autofocusing with 3-point multi-BASIS (▮ ✚ ▮).

◘ ✓ Any of the focusing points can be selected automatically by the camera, by eye-control, or manually by turning the dial.

◘ ✓ High-precision and high-speed Eye-Controlled Autofocus.

N ◘ ✓ Continuous Eye-Controlled Autofocus and predictive AF with AI Servo AF (a moving subject within the viewfinder is tracked according to eye movement).

N ◘ ✓ Self-learning calibration for horizontal and vertical framing (an orientation detection switch sets the respective algorithm automatically).

● Fast AF operation

✓ Same speed as with the EOS A2E.

● Operational under low-light conditions

✓ Operates under light as low as EV 0.

✓ AF-Illuminator linked to the three focusing points is built-in.

● Higher performance

✓ Autofocusing possible even with very low-contrast subjects (as low as 90:80).

✓ Crossed BASIS for autofocusing.

N ✓ AI Focus mode (automatic switching between One-Shot AF and AI Servo AF) can be set.

2. New Classy Design and Superb Operation Ease

● Camera design for tireless appeal.

N ● Metal exterior for a high-quality feel.

N ● Four mode dials (including the Command Dial) for setting the respective mode (exposure, metering, AF, and film transport) directly.

● Two control dials for fast operation.

● Superb grip.

✓ The fingers wrap around the camera for a firm grip.

✓ The battery pack makes vertical framing easy.

● Battery packs provide a wider selection of power sources.

● Eleven Custom Functions for the user to customize the camera.

3. AIM* System and Full-Featured Exposure Control

*: AIM: Advanced Integrated Multi-point Control

N
- New Flash System (with the Speedlite 380 EX) for more intricate control.
  - ✓ Evaluative flash metering (with a 6-zone silicon photocell) with focusing point linkage and memory function.
  - ✓ High speed synchronization (called "FP flash") allows flash synchronization at all shutter speeds. (Enables fill-in flash with a large aperture.)
- FE lock (flash exposure lock, auto flash with TTL partial metering and memory function).
  - ✓ Custom Function No. F-8 can link FE lock to the focusing point.
- Evaluative, partial, and center-weighted averaging metering modes provided with the 6-zone metering sensor (SPC).
  - ✓ Evaluative metering coupling to any of the three focusing points.
  - ✓ Custom Function No. F-8 can link partial metering to the focusing point.
- Focusing point-linked 3-zone TTL auto flash metering.
- Nine AE modes (P, Tv, Av, DEP, Full Auto, Image Modes, E-TTL, A-TTL, TTL auto flash) plus manual.
- Instantaneous adjustment of exposure compensation (in half stop steps up to ±2 stops) with the Quick Control Dial.
- Flash exposure compensation in half stop steps up to ±2 stops.

4. Silent Film Transport

- The belt drive, floating supports, and PWM control also found in the EOS 100 / ELAN make film transport operations quiet.

5. Built-in Auto Flash

- Built-in retractable flash pops up automatically.
  - ✓ Guide No. 13 (in meters at ISO 100 with 28mm lens)
  - ✓ In the Full Auto mode and certain Programmed Image Control modes, the flash pops up and fires automatically under low-light or backlit conditions.
  - ✓ In a Creative Zone mode, the built-in flash can be turned on or off manually.
  - ✓ Quick two second recycling.
  - ✓ Second-curtain sync can be set with Custom Function No. F-6.
  - ✓ Flash exposure compensation feature provided (adjustable in half stop steps up to ±2 stops).
  - ✓ Red-eye reduction feature provided.

Table 1-1 Model Differences

	Japan	North America				Europe and Others			
Product Logo	EOS 55 EYE CONTROL	EOS ELAN IIE EYE CONTROL	EOS ELAN IIE QUARTZ DATE	EOS ELAN II	EOS ELAN II QUARTZ DATE	EOS 50E EYE CONTROL	EOS 50E QUARTZ DATE	EOS 50	EOS 50 QUARTZ DATE
Eye-Controlled Autofocus	○	○		×		○		×	
Date Imprinting	○	×	○	×	○	×	○	×	○
Panorama Mode	○	×							
Manual Exposure	-2.1.0.1.2+	-2.1.0.1.2+				-2.1.0.1.2+			
Viewfinder									
Viewfinder Information									
LCD Panel									
Command Dial									

2. SPECIFICATIONS

1. Type

1-1 Type:	35mm single-lens reflex AF camera with vertical-travel focal-plane shutter, built-in motor drive, built-in flash, and automatic exposure.
1-2 Picture size:	24 mm x 36 mm (normal) or 13.3 mm x 36 mm (panorama) (EOS 55 only)
1-3 Compatible lenses:	Canon EF lenses
1-4 Standard lens:	Canon EF 28-80mm *f*/3.5-5.6 USM
1-5 Lens mount:	Canon EF mount

2. AF

2-1 Type: TTL-CT-SIR (Through-the-Lens Cross-Type Secondary Image Registration) multi-BASIS with cross-type sensor at the center and a vertical line-sensitive sensor on the left and right.

2-2 Focusing Modes: The following four modes are provided:

(1) One-Shot AF
Autofocus locks when focus is achieved.
* AF-priority: The shutter can be released only when focus is achieved.
* When a USM lens is used, manual focusing with the electronic focusing ring is enabled after autofocus is achieved or cannot be achieved.

(2) Predictive AF with AI Servo AF
Tracks subject movement up to the start of exposure.
Exposure mode for the first frame: Shutter speed-priority (with a Creative Zone mode).
AF-priority (with a Programmed Image Control mode).
Exposure mode for the second and subsequent frames during continuous shooting: AF-priority (lens-drive priority)

(3) AI Focus: Switches between One-Shot AF and AI Servo AF automatically.

(4) Manual focusing: Focus aid provided.

2-3 Focus Point Selection: After the focusing point selector is pressed, the Main Dial can set one of the following three selection modes:

Special Symbols
Custom Function
Specifications:
N Normal (0)
Y Custom (1) or (2)

D Eye-controlled Focus Items

D (1) Eye-Controlled Focusing point selection
In the One-Shot AF mode: Looking at the desired focusing point while pressing the shutter button halfway selects that focusing point.
In the predictive AF or AI Servo AF mode: The initial autofocusing operation is the same as with the One-Shot AF mode. But while the shutter button is pressed halfway or during continuous shooting, the autofocus tracks the subject according to eye movement and AF distance information.
In AI Focus mode: The initial autofocusing operation is the same as with the One-Shot AF mode. However,

if the subject moves after focus is achieved in the One-Shot AF mode, the camera switches automatically to the AI Servo AF mode for predictive AF. Then while the shutter button is pressed halfway or during continuous shooting, the autofocus tracks the subject according to eye movement and AF distance information.

In the Full Auto mode, Eye-Controlled Autofocus is disabled and the focusing point is camera-selected.

* Calibration for Eye-Controlled Autofocus can be entered for up to three users. Eye-Controlled Autofocus can be calibrated for horizontal and vertical framing.

The calibration sequence is as follows:

1. Set the Command Dial to CAL.
2. The far-right (or top) focusing point blinks.
3. Look at the far-right (or top) focusing point.
4. Press the shutter button halfway.
5. Calibration is confirmed.
6. The far-left (or bottom) focusing point blinks.
7. Look at the far-left (or bottom) focusing point.
8. Press the shutter button halfway.
9. Calibration is confirmed and completed.

(2) Manual focusing point selection
The dial-selected focusing point is set.

(3) Automatic focusing point selection
In the One-Shot AF mode: Based on the subject information obtained by the three focusing points, the optimum focusing point is selected by the camera.

In the predictive AF and AI Servo AF mode: The center focusing point is initially selected. If the subject moves to another focusing point, AI Servo AF will continue to track the subject.

In the AI Focus mode: The One-Shot AF mode selects the optimum (closest) focusing point based on the subject information obtained by the three focusing points. Subject movement is detected by the center focusing point. After the mode switches to predictive AF and AI Servo AF, the subject is tracked if it moves from the center focusing point to another focusing point. (If the subject is initially focused with the left or right focusing point in the One-Shot AF mode and it later moves, the subject movement will not be detected. Therefore, when shooting a moving subject, using the center focusing point for initial focusing is recommended.)

2-4 AF activation:
N AF is activated by pressing the shutter button halfway.
Y The AE lock button can also be set to activate AF. (In this case, AE lock is activated by pressing the shutter button halfway.)

2-5 AF operation speed: Same as with the EOS A2E.

2-6 In-focus indicator: Provided in viewfinder (LCD).

Y The focusing point flashes on the screen and a beeper sounds. In-focus beeper can be enabled or disabled.

Y Focusing point flashing can be disabled.

2-7 AF precision: Same as with the EOS 650.

2-8 AF working range: EV 0-18 (at ISO 100), according to Canon's testing conditions.

2-9 AF-Illuminator: N Emitted automatically when necessary and aimed at the area covered by the active focusing point. Range of 6 meters from the center and 3.5 meters for the left or right focusing point. Effective with 28mm to 135mm lenses.

* When used with an EOS-dedicated Speedlite: With the ***540EZ*** (which can emit a focusing point-linked AF-Illuminator), the Speedlite's AF-Illuminator is emitted instead of the camera's.
With other EZ-series Speedlites and the 160E, the camera normally emits the AF-Illuminator. The Speedlite's AF-Illuminator is emitted instead only when the center focusing point has been selected with the Main Dial.

Y The camera's AF-Illuminator can be disabled. Doing so also disables the Speedlite's AF-Illuminator.
The AF-Illuminator is emitted automatically for low-contrast subjects.

3. Viewfinder

3-1 Type: SLR-type, fixed eye-level pentaprism (no condenser lens).

3-2 Focusing screen: Non-interchangeable New Laser-matte screen (See Table 5 on page 12.).

1. Marked with focusing points (in models without Eye Control Focus).

D 2. Marked with focusing points and depth-of-field preview mark (in models with Eye Control Focus)

D 3. Marked with focusing points, depth-of-field preview mark, and panorama frame (in EOS 55).

3-3 Standard diopter: -1 diopter (20mm eye relief)

3-4 Picture coverage: 90 percent vertically, 92 percent horizontally.

3-5 Magnification: 0.71X (with 50mm lens at infinity)

3-6 Viewfinder information:

(1) Within Field of View

1. Focusing points with superimposed illumination (for focusing screens described in 1 to 3 in 3-2 above)
2. Panorama frame (for the focusing screen described in 3 in 3-2 above). LEDs beside the screen also indicate the panorama mode.

D 3. Depth-of-field preview mark (for focusing screens described in 2 and 3 in 3-2 above)

(2) Below field of view, Alphanumeric (yellow-green) display

1. Shutter speed (If unsuitable, it blinks at 2 Hz as a warning.)
2. Aperture setting (If unsuitable, it blinks at 2 Hz as a warning.)
3. Depth-of-field AE mode (DEP1, DEP2)
4. FE lock (FEL)
5. Calibration indicator (CAL-1 to 3, END-1 to 3)

(3) Below field of view Symbol display (yellow-green)

1. ✱ indicates AE lock.
2. $^{-2,1,0,1,2+}$: Exposure level (±2 stops) in 1/2 stops .
   a. Exposure compensation (in an AE mode)
   b. Flash exposure compensation
   c. Manual exposure level
   d. Automatic exposure bracketing amount
   e. Red-eye reduction lamp-on indicator (Same as with the EOS A2E.)
3. ⚡: Lights when flash exposure compensation is set.
4. ⚡: Lights when the flash is ready or blinks when the FE lock is unsuitable.
5. 👁: Lights when Eye-Controlled Autofocus is enabled or blinks when eye movement cannot be detected properly.
6. •: In-focus indicator (Blinks at 2 Hz if focus cannot be achieved.)
7. H: Lights when a high sync speed is used.

(4) Orange panorama-mode LEDs on the left and right of screen (EOS 55 only):

Note: The display of the viewfinder information outside the screen cannot be disabled.

3-7 Mirror: Quick-return half mirror (Transmission ratio of 40:60)

3-8 Mirror lockup: Y With the self-timer on, the mirror locks up when the shutter button is pressed completely.

3-9 Mirror vignetting: No vignetting with an EF 300mm f/2.8 lens combined with Extender EF 2X.

3-10 Depth-of-field preview:

1. Y Stops down the aperture when the eye looks at the depth-of-field preview mark.
2. Y The AE lock button can be set to stop down the aperture.

3-11 Eyepiece shutter: None. (Eyepiece cover provided with the neck strap.)

3-12 Mirror noise: Lower than 75 dB (target)

3-13 Miscellaneous.: Eyecup Ed provided (As with EOS A2E.)
The new Eyecup-equipped dioptric correction lenses allow Eye-Controlled Autofocus with or without eyeglasses.)
Angle Finder B is attachable with Angle Finder Adaptor Ed. (Eye-Controlled Autofocus is not possible.)
Existing E-series dioptric correction lenses mounted on Rubber Frame Ed can be attached and Eye-Controlled

Autofocus is possible providing the eye is placed close to the eyepiece. It is not possible with eyeglasses.
A magnifier cannot be used with eye-controlled focus.

4. Exposure Control

4-1 Metering modes:

TTL max. aperture metering with a 6-zone silicon photocell. The following three metering modes are provided:

(1) Evaluative (coupling to any of the three focusing points)

(2) Approx. 9.5-percent partial (9 mm dia.)

N Partial metering at center.

Y Partial metering linked to focusing point selected with the Main Dial or by Eye-Controlled Autofocus. (When the focusing point is camera-selected, partial metering is fixed at the center.)

(3) Center-weighted averaging metering

4-2 AE modes:

1. Intelligent program AE (Shiftable)
2. Shutter speed-priority AE (No safety shift feature)
3. Aperture-priority AE (No safety shift feature)
4. Depth-of-field AE (Shiftable)
   1) When the focusing point has been selected with the Main Dial, the selected focusing point is used to set the two depth-of-field points.
   2) When the focusing point is camera-selected, the center focusing point selects the two depth-of-field points.
   3) With Eye-Controlled Autofocus, the two depth-of-field points can be set with any of the focusing points respectively selected by the eye. The position of the eye when the shutter button is pressed halfway the third time selects the focusing point-linked zone where evaluative or partial metering is to be weighted.
5. Full Auto (Intelligent Program AE not shiftable)
6. Programmed Image Control modes
   Portrait, Landscape, Close-up, and Sports
7. E-TTL program flash AE
8. A-TTL program flash AE
9. TTL program flash AE
10. Metered manual exposure

* The following table shows the settings which are set automatically (indicated by a black dot) by the camera or which can be set by the user (indicated by a white dot) in the Programmed Image Control modes.
When the Speedlite is set to A, it fires automatically under low-light or backlit conditions.
Also, Programmed Image Control modes override all Custom Function settings.

Table 1-2 Full Auto and PIC Mode Settings

Mode	AF			Film Adv.		Metering			Program AE					Auto-Flash	Focus Point Selection			Focus Beeper	Mid-roll Rewind	Red-eye Redu..
	O	AIS	AIF	S	C	Eval.	A*	Par	PH1	PH2	PH3	PS	PL		ECF	Auto	Man.			
Full Auto			●			●						●		●		●	-	●	○	○
PIC Portrait	●				●	●				●				●	○	○	-	●	○	○
PIC Lands.	●			●		●							●		○	○	-	●	○	○
PIC Close-up	●			●		●					●			●	○	○	-	●	○	○
PIC Sports		●			●	●			●						○	○	-	●	○	○

4-3 Metering range: EV 1-20 (at 20°C with 50mm *f*/1.4 lens, ISO 100) (Target)

4-4 Exposure warning: LCD numeric display blinks at 2 Hz on LCD panel and in the viewfinder.

4-5 Exposure metering: Activated when shutter button is pressed halfway. The exposure reading continues to be displayed for 4 sec. after the shutter button's halfway pressing is released.

4-6 Film Speed Range: **N** ISO 25-5000 with DX-coded film, set automatically in one-third steps. (The number of exposures cannot be read with the DX code.)

Y Manually from ISO 6-6400 in one-third steps.

4-7 Exposure compensation: (1) Automatic Exposure Bracketing (AEB)

1. Availability: AEB is possible in the AE modes listed in the table below.
2. Bracketing amount: ±2 EV in half steps.
3. Bracketing sequence: Correct / underexposure / overexposure, taken singly or continuously. When the self-timer is activated, the three shots will be exposed continuously after the self-timer delay.
4. How each mode compensates the exposure is shown in the following table. (A black dot indicates the exposure compensation method used.)

Table 1-3 Exposure Compensation by mode

Mode	Shutter speed	Aperture
Intelligent Program AE	●	●
Shutter speed-priority AE		●
Aperture-priority AE	●	
Depth-of-field AE	●	
Manual	●	

5. AEB cancellation: Set bracketing amount to 0.
6. After automatic exposure bracketing is started, the bracketing sequence will be reset to the first frame if any of the following is executed: The batteries are replaced, the bracketing amount is changed, the Command Dial is turned, film rewind is completed, the camera back is opened, the built-in flash pops up, an external Speedlite is recycled and ready. (AEB is not cancelled even if lens is interchanged.)

(2) Manual exposure compensation
Enabled up to ±2 EV in half steps with the Quick Control Dial.
* Manual exposure compensation can be set in combination with AEB.

(3) TTL auto flash exposure compensation with the built-in flash or a Speedlite
Exposure compensation is set with the function button and adjusted up to ±2 EV in half steps with the Main Dial and Quick Control Dial.
With Speedlite 540EZ or 430EZ, flash exposure compensation can be set with the Speedlite up to ±3 EV in one-third steps.

4-8 AE lock: By pressing AE lock button in a Creative Zone mode). Since it is independent, it can be used at anytime (as with the EOS A2E).

4-9 Multiple exposures: Max. 9 multiple exposures can be set. Can be cancelled or reset at any time. Multiple exposure setting is reset automatically after all multiple exposures are taken.

5. Shutter

5-1 Type: Vertical-travel, focal-plane shutter with all speeds electronically-controlled. Front and rear shutter curtains both have dedicated electromagnetic release control. (Curtain speed: 4.8 ms/24mm)

5-2 Shutter speeds: 30 to 1/4000 seconds in half steps (displayed numerically). X-sync at 1/125 sec. Intermediate shutter speeds (half steps) can be set in the shutter speed-priority AE and manual exposure modes.
* No elapsed-time indication during bulb.

5-3 Shutter release: Soft-touch electromagnetic release.

5-4 Release time lag: Shutter release time lag excluding AF operation time:
1) The time lag between pressing the shutter button completely from the halfway position and the exposure of the film: 92ms
2) The time lag between pressing the shutter button completely from the normal position and the exposure of the film: 185ms

5-5 Self-timer: Electronically-controlled, 10-sec. delay. (After starting, the self-timer is cancelled by turning the Command Dial or pressing the Self-timer/Remote control button again. The self-timer mode can be cancelled by setting the Command Dial to L or by pressing the Self-timer/Remote control button again. The self-timer is also cancelled automatically after four min. if not used.
Indication: Electronic beeper and blinking AF-Illuminator lamp (2 Hz for 8 sec., then 8 Hz for the remaining 2 sec)
N Pressing shutter button to SW-2 starts the self-timer.
Y Pressing shutter button to SW-2 locks up the mirror and release the shutter two seconds later.

5-6 Camera shake warning: If the shutter speed is slower than the reciprocal of the lens' focal length in the Full Auto or Programmed Image

Control mode, the shutter speed display blinks at 2 Hz as a warning.

5-7 Shutter noise: 75dB or less (Same as EOS Elan.)

6. Film Transport

6-1 Loading: Automatic take-up with a sprocketless system.
After the film leader is set properly and the back is closed, the film advances to frame 1 automatically, taking about one sec.

6-2 Advance system: Automatic film advance by coreless motor. Film perforation detection by an infrared photo reflector.

6-3 Advance modes: (1) Single-frame advance
(2) Continuous film advance
In a Creative Zone mode, the film advance mode can be set manually with the film transport mode dial.
In a Programmed Image Control mode, the film advance mode is set automatically.

6-4 Advance initiation: Initiated by an exposure-completed signal.

6-5 Advance speed: Approx. 2.5 fps

6-6 Transport check: Frame counter counts up or down during film transport.

6-7 Shooting capacity: The table below indicates the number of 24-exposure rolls that can be taken with a new 2CR5 battery and EF 50mm *f*/1.8 lens. Figures in parentheses indicate the number of rolls when Eye-Controlled Autofocus is not used. AE: AE usage FA: Flash usage.

Table 1-4 Shooting Capacity

Ambient Temperature	AE/FA Ratio		
	100/0	50/50	0/100
At 20°C	90 (110)	35 (40)	18 (20)
At -20°C	45 (50)	14 (15)	6 (7)

6-8 Rewind system: Automatic film rewind with a small coreless motor.

6-9 Rewind initiation: (1) Automatic rewind
Rewind initiated automatically when the end of the roll is detected or after 36 exposures are taken.
N Silent film rewind is set.
Y High-speed film rewind can also be set.
(2) Mid-roll film rewind
By pressing the manual rewind button
During either (1) or (2), pressing the manual rewind button switches to the other rewind mode (high-speed or silent).

6-10 Rewind confirmation: The frame counter counts down.
During automatic film rewind, the exposure level scale in the viewfinder also indicates that film rewind is in progress. (The scale bars "flow" from right to left.)

6-11 Rewind time(24exp): N Silent rewind mode : 12 sec. at 20°C
Y High-speed rewind mode : 6 sec. at 20°C

6-12 Leader position: N Film leader rewinds completely into the film cartridge.

	Y	The film leader can be left outside the film cartridge.
		If the shutter is released while the camera back is open, the shutter speed will always be 1/4000 sec. (This is to protect the shutter curtains.)
6-13 Rewind completion:		Indicated by the film cartridge symbol blinking at 2 Hz on the LCD panel.
6-14 Film-loaded check:		(1) Indicated by the film cartridge symbol displayed on the LCD panel.
		(2) Confirmable with the film window on the camera back.
6-15 Frame counter:		Electronic, numeric counter on LCD panel. (Counts down during film rewind.)
6-16 Transport noise:		At 15cm from the camera back: Film advance noise of 55dB or less Film rewind noise of52dB or less (high speed) and 42dB (silent rewind).

7. Built-in Flash

7-1 Type:		Built-in, retractable TTL auto flash head in the pentaprism. Series-circuit controlled.
7-2 Guide No.:		13 (m) (at ISO 100)
7-3 Recycling time:		Approx. 2 sec.
7-4 Coverage:		Covers 28mm lenses.
7-5 Extension:		By Flash button for pop-up only. Retract manually.
7-6 Activation:		1. In a Creative Zone mode, flash button fires flash manually.
		2. In the Full Auto, Portrait, and Close-up modes, the flash pops up and fires automatically under low-light or backlit conditions.
7-7 Aperture setting:		(1) In the Program mode: Set automatically according to the TTL program.
		(2) In the aperture-priority AE and manual modes: Set by the user.
		(3) In the shutter speed-priority AE mode: Set automatically to match the shutter speed.
7-8 Sync speed:		(1) In the Program mode: Set automatically to 1/60 to 1/125 sec.
	N	(2) In the aperture-priority AE mode: Set automatically to 1/30 to 1/125 sec. to match the aperture value.
	Y	The sync speed can be fixed at 1/125 sec.
		(3) In the shutter speed-priority AE and manual modes: A sync speed of 1/125 sec. or slower can be set (in half steps) by the user.
		* During flash use, the metering mode (evaluative [no alpha compensation], partial, or center-weightcd averaging) set with the camera operates as usual.
7-9 Exposure system:		TTL off-the-film auto flash exposure (3-zone flash metering linked to focusing point)
7-10 Output control:		Automatic flash output reduction for fill-in flash or bright-light conditions.

7-11 Exposure compensation: Up to ±2 EV in half steps. (Exposure compensation possible with built-in flash and Speedlite.)

7-12 Effective range: 1 to 4.6 m (at ISO 100 and f/2.8)
1 to 9.3 m (at ISO 400 [reversal film] and f/2.8)

7-13 Low-flash warning: None.

7-14 Confirmation indicator: None.

7-15 Ready indicator: Flash symbol FF lights in viewfinder. (When the flash is recycling and the symbol is still not lit, the shutter cannot be released.)

7-16 Synchronization: **N** First-curtain synchronization.
Y Rear-curtain synchronization. (See Custom Function F–6 in 8-1.)

7-17 Flash duration: 1.0 ms or less.

7-18 Color temperature: Equivalent to daylight.

7-19 Optical axis offset: 73.1mm from flash head center to lens optical axis.

7-20 Power source: Provided by the camera battery.

7-21 Red-eye reduction: The flash fires after the flash head's red-eye reduction lamp lights.

1. Type: Lamp
2. Compatible modes: All exposure modes.
3. Activation: Lights after the shutter button is pressed halfway and focus is achieved with One-Shot AF or AI Servo AF. Also lights during manual focusing with halfway pressing of shutter button.
4. Duration: Under the conditions specified in 3 above, the lamp lights for as long as the shutter button is pressed halfway. (During self-timer operations, it lights for two sec. before the shutter is released.)
5. Lamp indicator: The exposure level scale in the viewfinder indicates when the lamp is on for 1.5 seconds (Same as the EOS A2E.)
6. Release locking: None.

7-22 Miscellaneous: Attaching a Speedlite disables the built-in flash.

8. Body

8-1 Custom Functions: Eleven Custom Functions are provided. The desired custom functions is selected by setting the Command Dial to "CF" and turning the Main Dial. The custom function can then be set by pressing the AE lock button.

No.	Custom Function	Function
C01:	Film rewind mode	0: Automatic silent rewind at the end of the roll. 1: Automatic high-speed rewind at the end of the roll.
C02:	Film leader position	0: Rewinds the film leader into the cartridge. 1: Leaves the film leader outside the cartridge.
C03:	Film speed setting	0: Film speed set automatically by the DX code. 1: Film speed set manually.
C04:	AE Lock and AF	0: Enables AF operation by pressing the shutter button halfway and enables AE lock with the AE lock button. 1: Enables AF operation by pressing the AE lock button and enables AE lock by pressing the shutter button halfway. 2: Enables AF operation by pressing the shutter button halfway and enables the AE lock button to stop down the aperture. (When either 1 or 2 is set, FE lock with Speedlite 380 EX does not function.)
C05:	Mirror lock & self-timer	0: Enables normal self-timer and remote control operations. 1: Enables the shutter button (when pressed completely) to lock up the mirror and release the shutter 2 sec. later. (Mirror lockup is also possible with Remote Controller RC-1 set for a 2-sec. delay.)
C06:	Flash sync timing	0: Front-curtain synchronization. 1: Rear-curtain synchronization (with the built-in flash or Speedlite 380 EX.)
C07:	AF-Illuminator	0: Enables automatic emission of AF-Illuminator. 1: Disables AF-Illuminator.
C08:	Partial metering and FE lock linkage to focusing point	0: Links partial metering and FE lock to the center. 1: Links partial metering and FE lock to selected focusing point. If focusing point is set for automatic selection, partial metering and FE lock will be linked to the center.)
C09:	Shutter speed setting during Av AE or flash use	0: Sets shutter speed automatically. 1: Sets shutter speed to 1/125 sec.
C10:	Focusing point flashing	0: Enables focusing point flashing. 1: Disables focusing point flashing.
C11:	Eye-activated D-o-F:	0: Enabled. (Enabled for six seconds after focus is achieved in One-Shot AF mode.) 1: Disabled.

8-2 Camera back: Opened with the back cover latch. Not detachable. Film window provided. No film memo holder.

8-3 Flash contacts: X-sync. Direct contacts on accessory shoe. Speedlite locking pin hole provided.

8-4 Auto flash operation: In the Program AE mode:

(1) With Speedlite 380 EX

1) During normal use: When the Speedlite is ready, the sync speed (1/60 to 1/125 sec.) is set automatically and the aperture is set automatically according to the camera's E-TTL program. When the shutter button is pressed completely, the flash fires a preflash of a certain output immediately before the mirror flips up. The AE sensor reads the background light before the preflash and the light reflected off the subject during the preflash. The output of the main flash is then determined according to the difference of the two light readings. The main flash then fires. If the 380EX's high sync speed (FP flash) switch is on and the light level is too bright for the smallest aperture, the high sync speed mode will be set automatically, enabling synchronization with all shutter speeds. (When the high sync speed is set, "H" will be displayed in the viewfinder.) Automatic fill-in flash is possible.

2) During FE lock: When the 380 EX is attached, the AE lock button becomes an FE lock button. Pressing the AE lock button fires a preflash. The AE sensor (partial metering) then reads the light reflected off the subject. The flash output is determined and retained in memory. When the shutter button is pressed halfway or completely, the flash is controlled according to the flash output retained in memory. (FE lock will be disabled if Custom Function No. F-4 is set to 1 or 2.)

If the 380EX's high sync speed (FP flash) switch is on and the light level is too bright for the smallest aperture, the high sync speed mode will be set automatically, enabling synchronization with all shutter speeds. (When the high sync speed is set, "H" will be displayed in the viewfinder.)

Insufficient-flash warning provided (The FF symbol blinks at 2 Hz if the flash output is insufficient by a half or more stops for a proper exposure.)

Automatic fill-in flash is possible.

(2) With the built-in flash and TTL auto flash metering When the Speedlite is ready, the sync speed (1/60 to 1/125 sec.) is set automatically and the aperture is set automatically according to the camera's TTL program. TTL off-the-film auto flash control with 3-zone flash metering linked to focusing point. Automatic fill-in flash is possible.

(3) With an EZ-series Speedlite and A-TTL auto flash exposure: When the Speedlite is ready, the sync speed (1/60 to 1/125 sec.) is set automatically and the optimum aperture is set automatically according to the camera's A-TTL program and the result of the Speedlite's near-infrared preflash which measures the subject's distance and brightness. TTL off-the-film auto flash control with 3-zone flash metering linked to the focusing point. Automatic fill-in flash is possible.

(4) With the ML-3 and TTL auto flash metering
See (2) above.

* For (1) to (4) above, a sync speed of 1/125 sec, or slower can be selected when the camera is set to shutter speed-priority AE. Also, when the 380 EX is attached and the high sync speed switch is on, a sync speed faster than 1/125 sec. can be set. In the aperture-priority AE mode, any aperture can be selected.

(5) Other combinations

1) With a T- or A-series flash unit, manual exposure is required.

* Set the shutter speed manually to 30 to 1/125 sec. or bulb.
* Set the same aperture value manually on the camera and flash unit.

2) With a non-Canon flash unit
For portable flash units: Set the sync speed to 1/125 sec. or slower.
For studio flash: Set the sync speed to 1/60 sec. or slower.
(Check that the flash duration is sufficient.)

8-5 Remote control:	2.5 mm dia. mini-jack remote control terminal provided. Wireless remote control sensor is built-in (for Remote Controller RC-1).
8-6 Date printing: EOS 55:	Printing position shifts automatically for the normal and panorama picture sizes. For other QD versions: Imprinting position is fixed for the normal picture size. For all QD versions, date range: 1994 1 1 to 2019 12 31.
8-7 Power source:	One 2CR5 lithium battery (6 V). With the BP-50 battery pack attached, four alkaline or NiCd batteries. With the BP-5B attached, four size-D alkaline batteries. Size AA Lithium Cells cannot be used.
8-8 Main switch:	Camera turns off when the Command Dial is set to L (locked position).
8-9 Battery check:	Battery level is displayed automatically and constantly when the Command Dial is set to a mode other than L. Battery power is indicated in one of four levels.
8-10 EXternal display:	Large LCD panel provided.
8-11 Tripod socket:	CU 1/4 socket provided.

8-12	Interchangeable grip:	None. BP-50 battery pack can be attached.
8-13	Body material:	Polycarbonate resin with glass fiber.
8-14	Exterior color:	"Warm Gray"(aluminum color) and black.
8-15	Dimensions:	152.5(W) x 104.5(H) x 71(D)mm (Body thickness: 53mm)
8-16	Weight:	EOS 55: 595g; (add 40 g with the lithium battery) EOS ELAN IIE (QD) & EOS 50E (QD): 590g EOS ELAN IIE, EOS ELAN II (QD), EOS 50E,& EOS 50 (QD): 585g EOS ELAN II & EOS 50: 580g

9. Major Accessories

9-1 New accessories

(1) Speedlite 380 EX
(2) Size-AA BP-50 battery pack (with vertical-grip shutter button)
(3) High-capacity BP-5B battery pack (size-D batteries)
(4) Semi-hard case
(5) Eyecup-equipped dioptric correction lenses (compatible with EOS A2E)

9-2 Major EOS System accessories

(1) EF lenses
(2) Speedlite 540EZ and external power packs
(3) Speedlite 430EZ and external power packs
(4) Speedlite 420EZ
(5) Speedlite 300EZ
(6) Speedlite 200E
(7) Speedlite 160E
(8) Macro Ring Lite ML-3
(9) Remote Controller RC-1
(10) Remote Switch RS-60E3
(11) Eyecup Ed (for EOS A2E)
(12) Rubber Frame Ed (for EOS A2E)

10. Miscellaneous.

10-1 Film transport test conditions

(1) Battery: New 2CR5 battery (less than 3 months old)
(2) Lens: EF 50mm f/1.8II
(3) Exposure mode: Shutter-priority AE (at 1/1000s)
(4) Subject brightness: EV 15
(5) Eye-Controlled Autofocus: Activated
(6) Film advance mode: Continuous
(7) Film rewind mode: Silent rewind
(8) AF mode: One-Shot AF
(9) Film: Kodak Tri-X, 36- EX. (fresh roll)

(10) Shooting conditions:

1)	100-percent AE	The following operations were executed sequentially for each frame in accordance with the test procedure described below: AF search (infinity to near focus to infinity), AF achieved, meter on for 4 sec., and shutter release.
2)	100-percent flash use	The following operations were executed sequentially for each frame in accordance with the test procedure described below: Built-in flash pops up and recharges, AF search (infinity to near focus to infinity), AF achieved, meter on for 4 sec., shutter release, and retraction of flash head.
3)	50/50 Flash and AE	1) and 2) above were executed alternately.
	• At 20°C:	The following operation was repeated three times: Film loaded, 36 frames exposed, automatic film rewind (film removed), and 20 sec. later the Command Dial was switched between P and L (automatic battery check).
	• At -20°C	After the camera and film were exposed to a temperature of -20°C for three hours, the following operation was repeated three times at 3-min. intervals: Film loaded, 5-frame continuous shooting at 20-sec. intervals until 36 frames exposed (the last frame is exposed singly), automatic film rewind (film removed), and 20 sec. later the Command Dial was switched between P and L (automatic battery check).
10-2	Built-in flash range	The maximum flash range depends on the lens' maximum aperture. Item 7-12 showed the flash range when an *f*/2.8 lens is used. For other lenses, the maximum flash range (rounded off in meters) is calculated with the following formulas: 1. For negative film This formula takes the film's exposure latitude into account. It tolerates underexposure of one stop. ISO 100 film: Divide 18 by the maximum aperture. ISO 400 film: Divide 36 by the maximum aperture. 2. For reversal film For all film speeds: Divide the Guide No. (m) by the maximum aperture.

3. INDICATORS

3.1 LCD PANEL

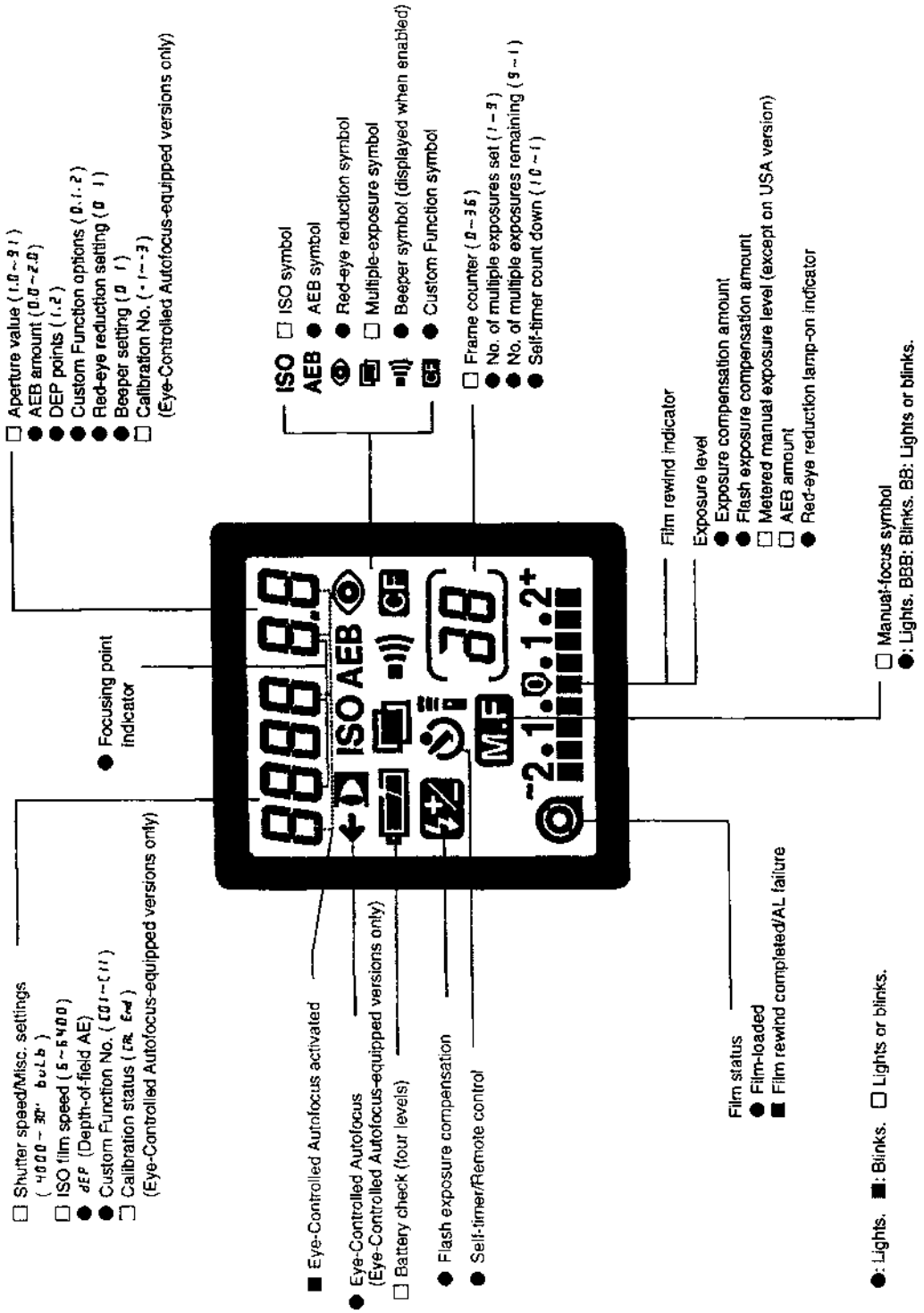

□ Aperture value (1.0~91)
● AEB amount (0.0~2.0)
● DEP points (12)
● Custom Function options (0.1.2)
● Red-eye reduction setting (0 1)
● Beeper setting (0 1)
□ Calibration No. (-1~-3)
(Eye-Controlled Autofocus-equipped versions only)
ISO □ ISO symbol
AEB ● AEB symbol
● Red-eye reduction symbol
□ Multiple-exposure symbol
● Beeper symbol (displayed when enabled)
CF ● Custom Function symbol
□ Frame counter (0~36)
● No. of multiple exposures set (1~9)
● No. of multiple exposures remaining (9~1)
● Self-timer count down (10~1)
Film rewind indicator
Exposure level
● Exposure compensation amount
● Flash exposure compensation amount
□ Metered manual exposure level (except on USA version)
□ AEB amount
● Red-eye reduction lamp-on indicator
□ Manual-focus symbol
●: Lights. BBB: Blinks. BB: Lights or blinks.
□ Shutter speed/Misc. settings
(4000~30" bulb)
□ ISO film speed (6~6400)
● dEP (Depth-of-field AE)
● Custom Function No. (C01~C11)
□ Calibration status (CAL End)
(Eye-Controlled Autofocus-equipped versions only)
● Focusing point indicator
■ Eye-Controlled Autofocus activated
● Eye-Controlled Autofocus
(Eye-Controlled Autofocus-equipped versions only)
□ Battery check (four levels)
● Flash exposure compensation
● Self-timer/Remote control
Film status
● Film-loaded
■ Film rewind completed/AL failure
●: Lights. ■: Blinks. □: Lights or blinks.

Fig. 1-1 LCD Panel

3.2 VIEWFINDER INDICATORS

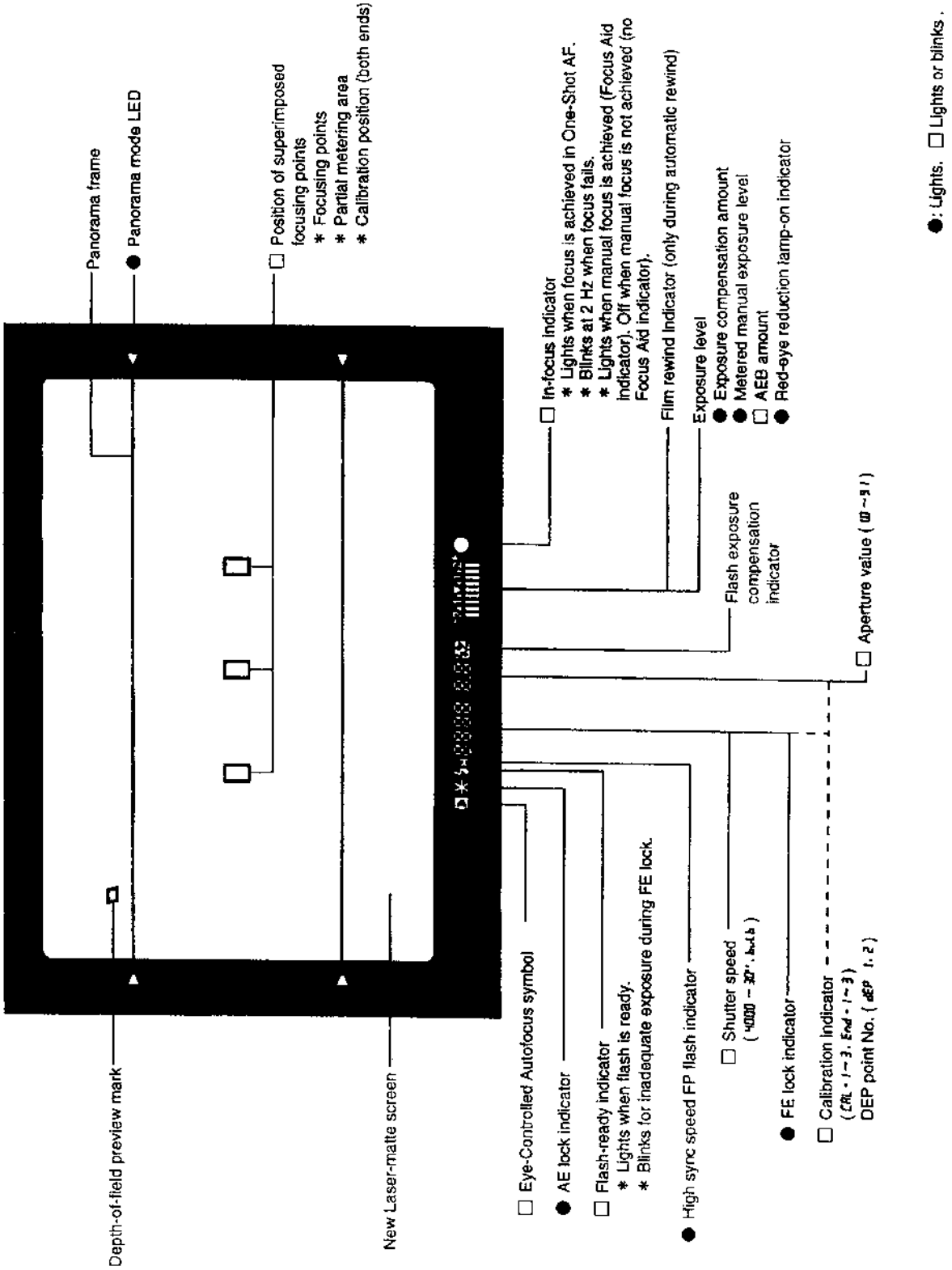

Panorama frame
● Panorama mode LED
□ Position of superimposed focusing points
* Focusing points
* Partial metering area
* Calibration position (both ends)
□ In-focus indicator
* Lights when focus is achieved in One-Shot AF.
* Blinks at 2 Hz when focus fails.
* Lights when manual focus is achieved (Focus Aid indicator). Off when manual focus is not achieved (no Focus Aid indicator).
Film rewind indicator (only during automatic rewind)
Exposure level
● Exposure compensation amount
● Metered manual exposure level
□ AEB amount
● Red-eye reduction lamp-on indicator
●: Lights. □: Lights or blinks.
Flash exposure compensation indicator
□ Aperture value (-)
Depth-of-field preview mark
New Laser-matte screen
□ Eye-Controlled Autofocus symbol
● AE lock indicator
□ Flash-ready indicator
* Lights when flash is ready.
* Blinks for inadequate exposure during FE lock.
● High sync speed FP flash indicator
□ Shutter speed
(-)
● FE lock indicator
□ Calibration indicator
(-)
DEP point No. ( )

Fig. 1-2 Viewfinder Indicators

TABLE 1-5: WITH 50MM *f*/1.8 LENS AT ISO 100 (DOTTED BOXES INDICATES DISPLAY BLINKING AT 2HZ)

Conditions / Mode		Low light level: Underexposure warning		Correct exposure display (at ISO 100, EV 12)		Bright light level: Overexposure warning	
		TVset	AVauto	TVset	AVauto	TVset	AVauto
AUTO	Tv AE	125	1.8 ■-2	125	5.6	125 ■-6	22
		TVauto	AVset	TVauto	AVset	TVauto	AVset
	Av AE	30''	5.6 ■-3	125	5.6	4000 ■-7	5.6
		TVauto	AVauto	TVauto	AVauto	TVauto	AVauto
	Program AE Landscape & Sports	30''	1.8 ■-1	125	5.6	4000 ■-5	22

TABLE 1-6: DEPTH-OF-FIELD AE WITH 50MM *f*/1.8 LENS AT ISO 100

Conditions / Mode	Low light level: Underexposure warning		Low light level: Insufficient depth-of-field warning		Correct exposure display		Bright light level: Overexposure warning	
	TVauto	AVauto	TVauto	AVauto	TVauto	AVauto	TVauto	AVauto
DEPTH	30''	1.8 ■-1	30''	5.6 ■-9	125	5.6	4000 ■-5	22

TABLE 1-7: METERED MANUAL WITH 50MM *f*/1.8 LENS AT ISO 100

	Underexposure warning		Correct exposure display		Overexposure warning	
	TVset	AVset	TVset	AVset	TVset	AVset
MANUAL	125	8	125	5.6	125	4.0
	-2.1.0.1.2+ ■-4		-2.1.0.1.2+		-2.1.0.1.2+ ■-8	

4.2 WARNINGS FOR A-TTL & TTL FLASH MODES

* Dotted box displays blink at a rate of 2 Hz.

Subject brightness	Low light level and normal flash		Intermediate light level and fill-in flash		Bright light level and fill-in flash	
	Underexposure warning for averaged metering		Correct exposure for averaged metering		Overexposure warning for averaged metering	
Mode	Correct TTL flash exposure		Correct TTL flash exposure		Correct TTL flash exposure	
Tv AE	TVset 125	AVauto 1.8 -2	TVset 125	AVauto 5.6	TVset 125	AVauto 22 -6
Av AE	TVauto 1''	AVset 5.6	TVauto 125	AVset 5.6	TVauto 125	AVset 5.6 -7
	* Note 1					
Program AE	TVauto 60	AVauto 1.8~22	TVauto 125	AVauto 5.6	TVauto 125	AVauto 22 -5
	* Note 2					

Note: 1. Display for automatic fill-in flash mode at EV 5. If the light level requires a 30-sec. shutter speed, 30'' will blink. -3
Note: 2. Indicates the typical indoor lighting conditions in the Program AE mode. There is no underexposure warning in this case.
*Note: If flash is used in the depth-of-field AE mode, program flash exposure will take effect.

4.3 WARNINGS FOR E-TTL FLASH MODES

* Dotted box displays blink at a rate of 2 Hz.

Subject brightness	Low light level and normal flash		Intermediate light level and fill-in flash		High light level and fill-in flash	
	Underexposure warning for averaged metering		Correct exposure for averaged metering		Overexposure warning for averaged metering	
Mode	Correct New E-TTL flash exposure		Correct New E-TTL flash exposure		Correct New E-TTL flash exposure	
Tv AE	TVset 125	AVauto 1.8 ■-2	TVset 125	AVauto 5.6	TVset 125	AVauto 22 ■-6
Av AE	TVauto 1''	AVset 5.6	TVauto 125	AVset 5.6	TVauto 125	AVset 5.6
	*Note 1				* Note 3	■-7
Program AE	TVauto 60	AVauto 1.8~22	TVauto 125	AVauto 5.6	TVauto 125	AVauto 22
	*Note 2				* Note 3	■-5

Note: 1. Display for automatic fill-in flash mode at EV 5. If the light level requires a 30-sec. shutter speed, 1 will blink. ■-3
Note: 2. Indicates the typical indoor lighting conditions in the Program AE mode. There is no underexposure warning in this case.
Note: 3. The F072's high sync speed (FP flash) switch is off for this display. If it is on and a shutter speed faster than 1/125 sec. is required for the minimum aperture, Tv auto will take effect.
*Note: If flash is used in the depth-of-field AE mode, program flash exposure will take effect.

4.4 COUNTERMEASURES FOR EXPOSURE WARNINGS

[1] Conditions: Basic body used with no flash.

Warning		Warning Display		Countermeasures
		Tv Display	Av Display	
1. Underexposure warning	①	30''	AVO	-1 (1) Use flash or artificial lighting. (2) Use a fast film. (3) Give up.
	②	TVset	AVO	-2 (1) Set a slower shutter speed until the aperture value display stops blinking.
	③	30''	AVset	-3 (1) Open the aperture until the shutter speed display stops blinking.
	④	TVset	AVset	-4 (1) Open the aperture or (2) set a slower shutter speed until the indicator matches up with 0 on the exposure level scale [redacted]
2. Overexposure warning	①	4000	AVmin	-5 (1) Use a neutral-density filter. (2) Use a slow film. (3) Give up.
	②	TVset	AVmin	-6 (1) Set a faster shutter speed until the aperture value display stops blinking.
	③	4000	AVset	-7 (1) Close the aperture until the shutter speed display stops blinking.
	④	TVset	AVset	-8 (1) Open the aperture or (2) set a slower shutter speed until the indicator matches up with 0 on the exposure level scale [redacted]
3. Depth-of-field warning		30''	AVauto	-9 (1) If the desired depth of field is not obtained, use a fast film. (2) Give up.

[2] Conditions: EOS used with Speedlite 540EZ or 430EZ

4. Max. sync speed warning	125	AVset	-7 (1) Close the aperture until the 1/125 sec. display stops blinking.

[3] Conditions: EOS used with Speedlite F072 for FE lock operation

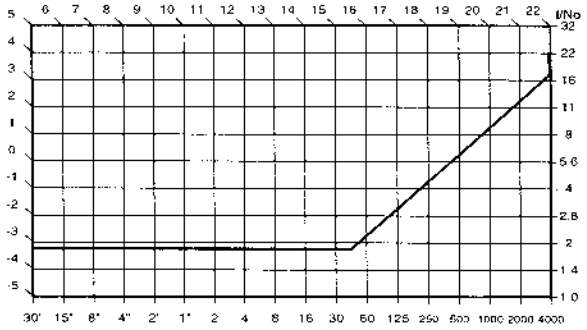
5. Insufficient flash exposure warning	ϟ	-10 (1) Open the aperture or (2) set a slower shutter speed until ϟ stops blinking.

Note: 1. Dotted box displays blink at 2 Hz.
Note: 2. "AVO" indicates the lens' maximum aperture, and "AVmin" indicates the lens' minimum aperture.
Note: 3. "TVset" and AVset" respectively indicate the shutter speed and aperture value set by the user.
Note: 4. "TVauto" and "AVauto" respectively indicate the shutter speed and aperture value calculated electronically and set automatically by the camera.

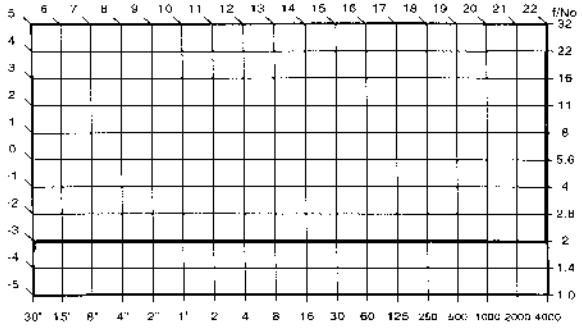
5. PROGRAM DIAGRAMS

5.1 PROGRAM DIAGRAMS (50MM *f*/1.8)

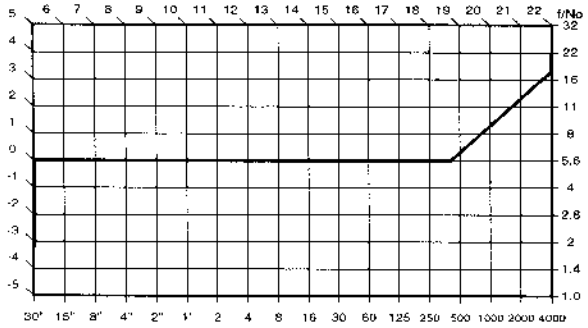
1. Standard Program AE



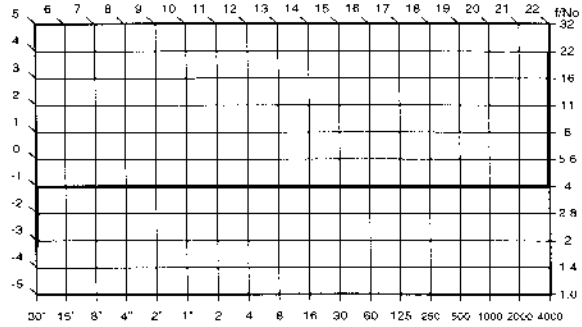
2. PIC Portrait



3. PIC Landscape



4. PIC Close-up



5. PIC Sports

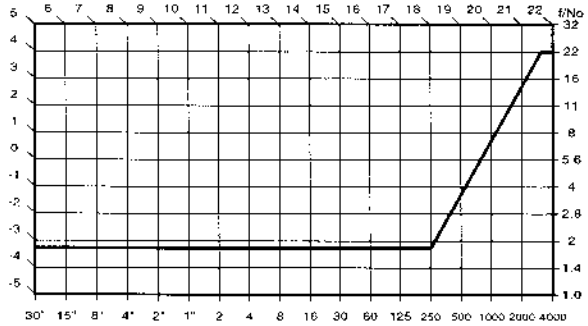
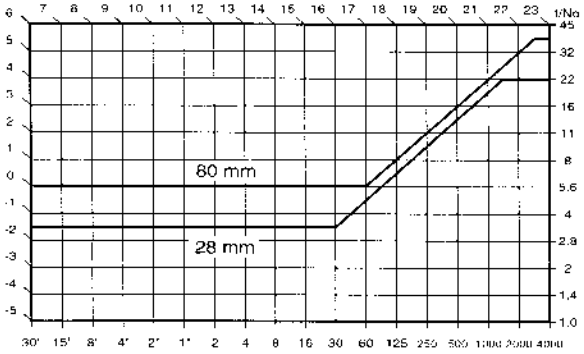


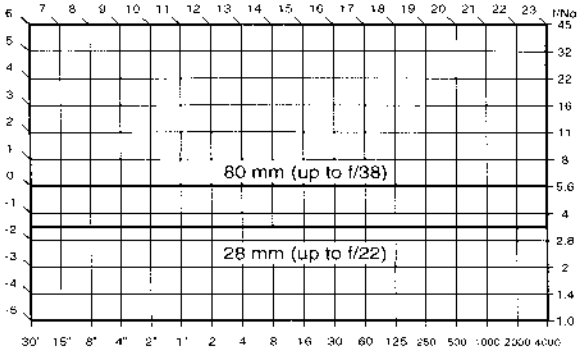
Fig. 1-3 AE Program Modes (50mm *f*/1.8)

5.2 PROGRAM DIAGRAMS (28-80MM *f*/3.5-5.6II USM)

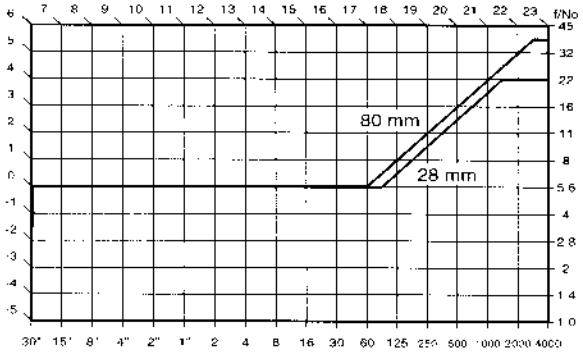
1. Standard Program AE



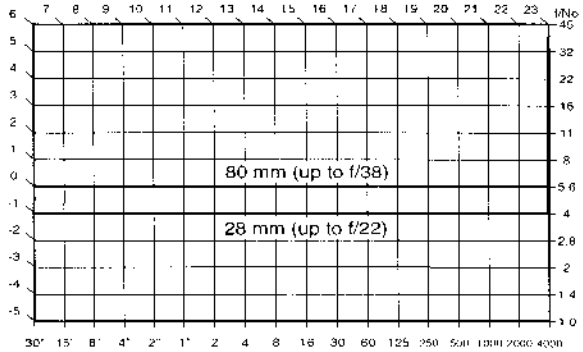
2. PIC Portrait



3. PIC Landscape



4. PIC Close-up



5. PIC Sports

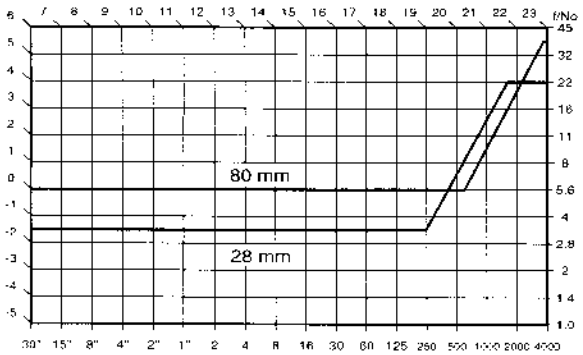


Fig. 1-4 EF 28-80mm *f*/3.5~5.6 II USM

5.3 PROGRAM DIAGRAMS USING FLASH

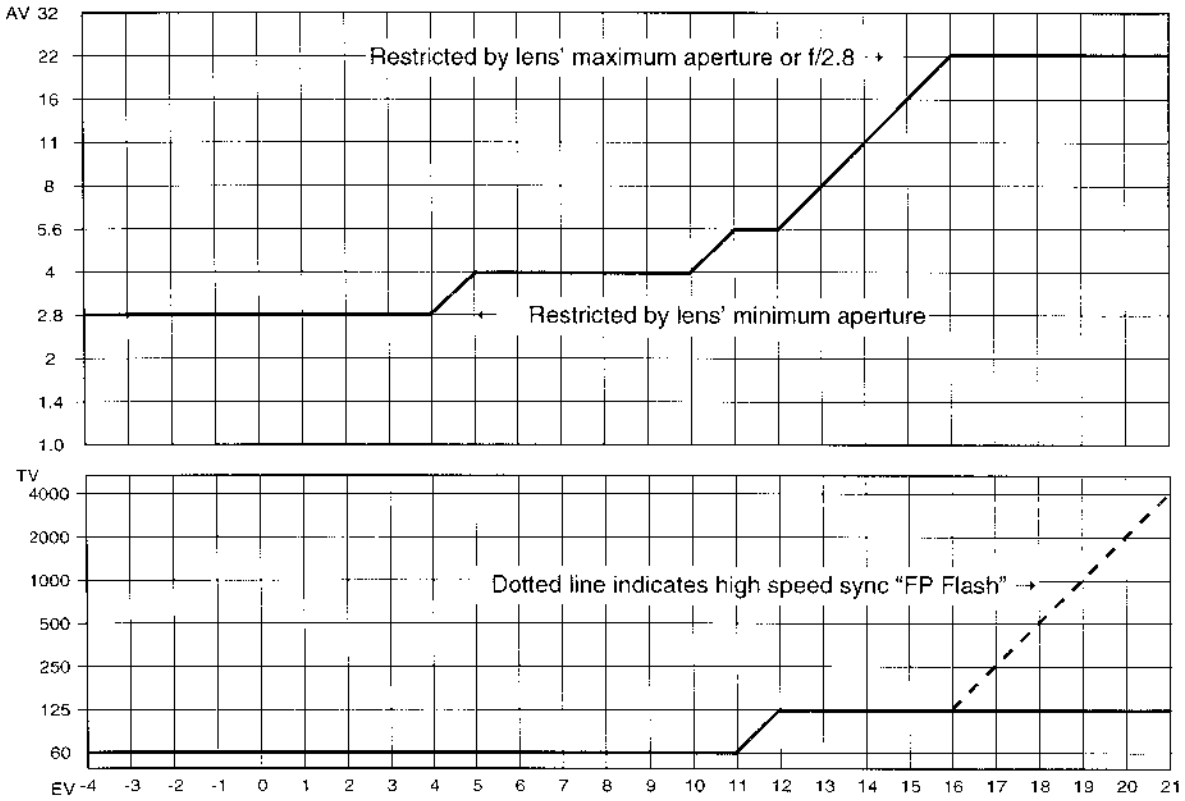


Fig. 1-5 Using Speedlite 380 EX

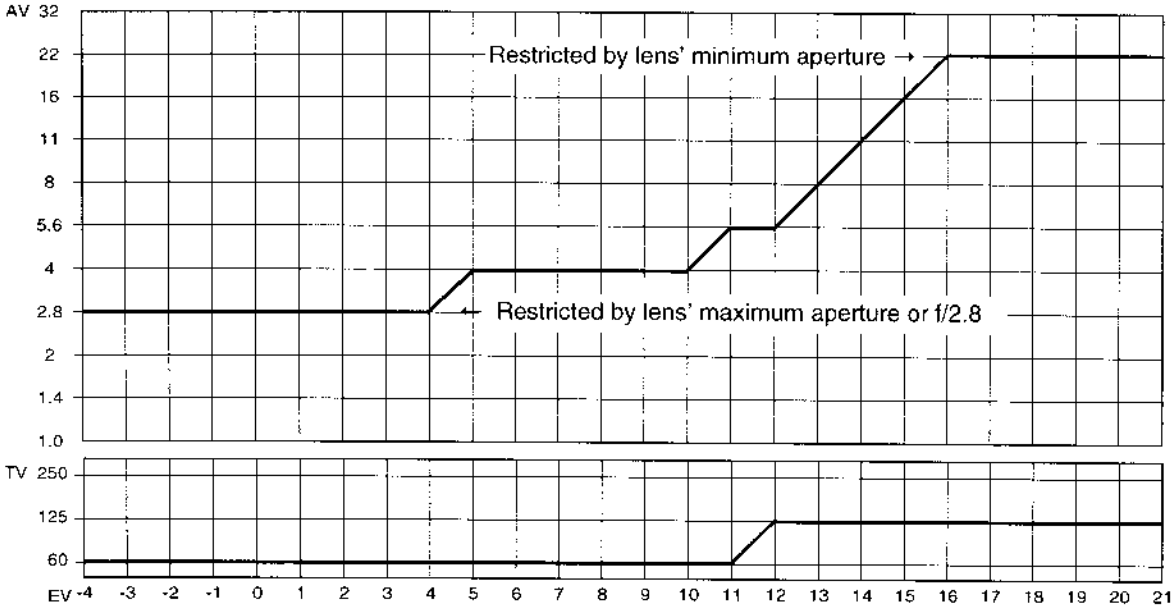


Fig. 1-6 Using Built-in Flash Program TTL

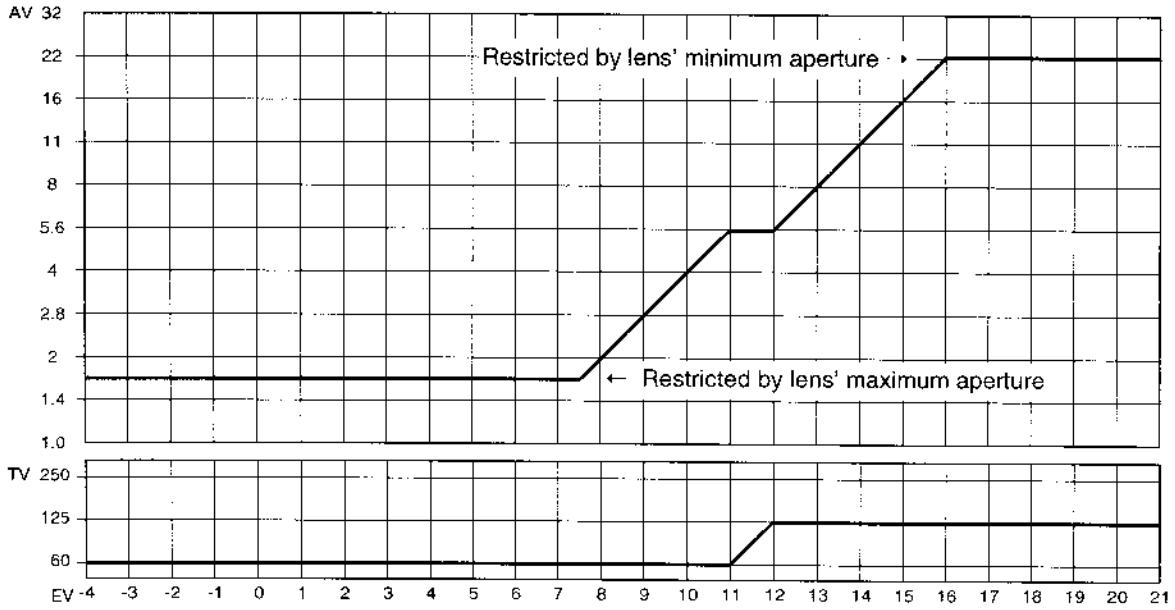


Fig. 1-7 Using Speedlite xxxEZ and Program A-TTL

6. EOS SYSTEM ACCESSORIES TABLES

Compatibility: ✓: Possible ✎: Possible under certain conditions ✗: Not possible

6.1 Interchangeable Lenses

PRODUCT NAME	COMPATIBILITY	NOTE
In general, all EF lenses can be used, therefore a complete list is not included here.		

6.2 Lens Attachments

PRODUCT NAME	COMPATIBILITY	NOTE
EF 2X Extender	✓	
EF 1.4X Extender	✓	
Life Size Convertor EF	✓	
Extension Tube EF25	✓	
Lens Mount Convertor FD-EOS	✗	
M-Lens Mount Convertor FD-EOS	✗	

6.3 Speedlites

PRODUCT NAME	COMPATIBILITY	NOTE
380 EX	✓	
540EZ System	✓	
480EG System	✓	
430EZ	✓	
420EZ	✓	
300EZ	✓	
200E	✓	
160E	✓	
ML-3set	✓	
Multiple flash system	✓	

6.4 EOS Series Covers and Cases

PRODUCT NAME	COMPATIBILITY	NOTE
Snap Case SA-4	✗	
Snap Case SB-4	✗	
EOS650/620 cases	✗	
EOS750/850 cases	✗	
EOS 1 cases	✗	
EOS 10 cases	✗	
EOS 1000 cases	✗	
EOS 100 cases	✗	
EOS 5 cases	✗	
EOS KISS / 500 / Rebel X cases	✗	
EOS 1N cases	✗	
EOS 5 cases	✓✓	

6.5 Bottom Accessories

PRODUCT NAME	COMPATIBILITY	NOTE
GR10	✗	
GR20	✗	
GR50 (for EOS750/850/700)	✗	
GR60 (EOS10 Grip Extension)	✗	
GR70 (EOS1000 Grip Extension)	✎	*1
VG10 (EOS5 Vertical Grip)	✗	
GR80TP w/tripod(EOS 500)	✗	
Power Drive Booster E-1	✗	
Battery Pack BP-E1	✗	
Battery Pack BP-5	✓✓	
Battery Pack BP-8	✗	
Battery Pack BP-50	✓✓	

6.6 Viewfinder Accessories

PRODUCT NAME	COMPATIBILITY	NOTE
Eye Cup E (650/620)	✗	
Eye Cup Eb (750/850)	✗	
Eye Cup Ec (EOS-1)	✗	
Eye Cup Ec-II (EOS-1N)	✗	
Eye Cup Ed (EOS-5)	✓	
Eye Cup Ed-E (EOS-5)	✓	
Dioptric Adjustment Lens E (10)	✓	
Rubber Frame Eb	✗	
Rubber Frame Ec (EOS-1)	✗	
Rubber Frame Ed (EOS-5)	✓	
Focusing Screen E (7 types)	✗	
Focusing Screen Ec (8 types)	✗	
Focusing Screen Ec-CII	✗	
Focusing Screen Ed (6 types)	✗	
Magnifier S	✎	*2
Angle Finder B	✓	
Angle Finder Adaptor Ed (EOS-5)	✓	
Eyepiece Extender EP- EX-15	✗	

*1: It can be attached, but the shape does not match that of the body.

*2: The Magnifier S is not compatible with eye-controlled focus

6.7 REMOTE DEVICES

PRODUCT NAME	COMPATIBILITY	NOTE
Remote Switch 60T3	✗	
Remote Switch RS-60E	✓	
Remote Controller RC-1	✓	
Wireless Remote Control LC-2	✗	
Wireless Remote Control LC-3	✗	

6.8 DATA BACKS

PRODUCT NAME	COMPATIBILITY	NOTE
Quartz Date Back E	✗	
Technical Back E	✗	
Keyboard Unit TB	✗	
Interface Unit TB	✗	
Command Back E	✗	

6.9 FILTERS

PRODUCT NAME	COMPATIBILITY	NOTE
Drop-in Circular Polarizing Filter PL-C48	✓	
Circular Polarizing Filter PL-C52	✓	
Circular Polarizing Filter PL-C58	✓	
Circular Polarizing Filter PL-C72	✓	
Circular Polarizing Filter PL-C77	✓	
Drop-in Gelatin Filter Holder II	✓	
Gelatin Filter Holder E52/58/72/77	✓	

6.10 MISCELLANEOUS

PRODUCT NAME	COMPATIBILITY	NOTE
Panorama Adaptor PA-1000	✎	*3

*3: Cannot be used in the Japanese model EOS 55, because it will damage the built-in panorama blades. It can be used in other models.

7. NOMENCLATURE & DIMENSIONS

7.1 NOMENCLATURE

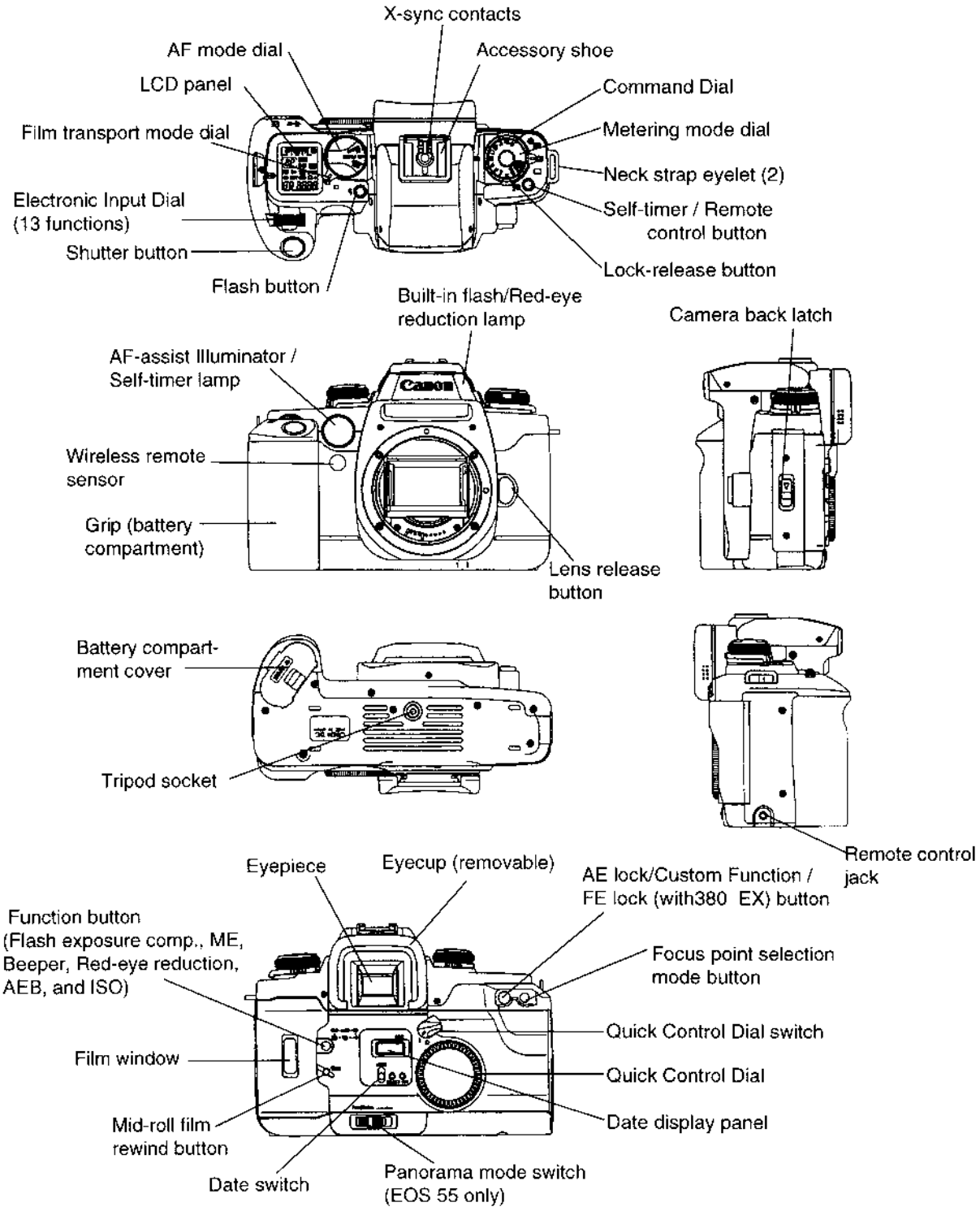


Fig. 1-8 Nomenclature

7.2 EXTERNAL DIMENSIONS

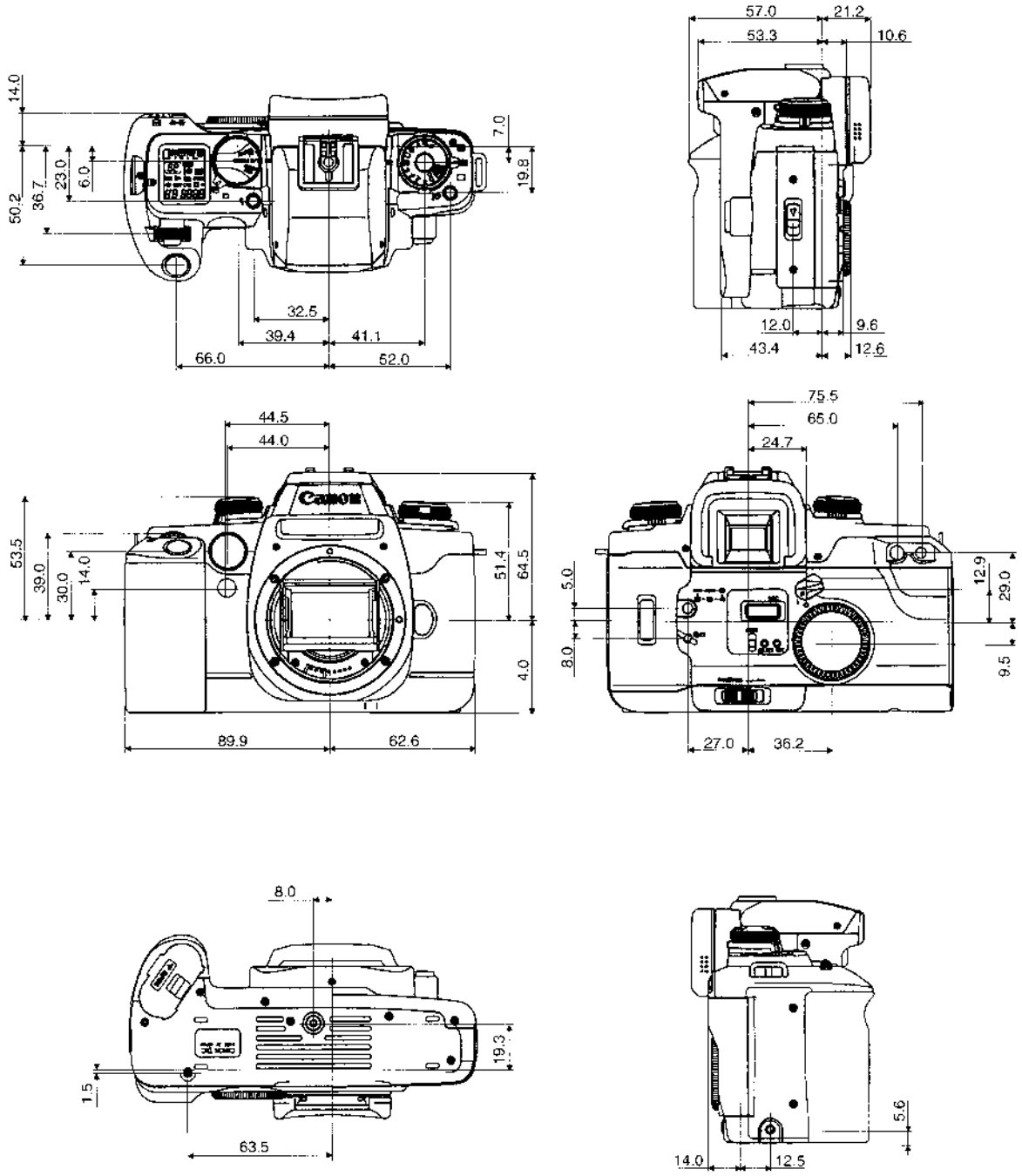


Fig. 1-9 External Dimensions

8. COMPETITOR COMPARISONS

Table 1-11 Comparison Table

Item	Maker →		CANON		Nikon		MINOLTA
	Camera →		EOS 55	EOS100(P)	F70 D	F601	α-5xi(P)
AF	One Shot AF		●	●	●	●	●
	Predictive Servo AF		●	●	●	●	●
	Automatic One-shot/Servo AF		●	●	—	—	●
	Eye-controlled AF		●	●	—	—	—
	Manual		●	●	●	●	●
	AF Speed		★★★★★	★★★★★	★★★	★★★	★★★★
	Focus ing Area		I+I	+	+	—	—
	Focus Point Selection		●	—	—	—	—
	Working Range (EV)		0–18	0–18	-1–19	-1–19	-1–18
	AF Illuminator Range (meters)		(6), linked to 3 focus points	●(7)	—	—	●(5)
Viewfinder	Magnification (50mm at ∞)		0.71	0.75	0.77	0.75	0.82
	Eye-controlled input		●	—	—	—	—
	Display		Fu› numeric display / Metered Manual Sca‹e	Full numeric display / Metered Manual Sca e ± symbols	Full numeric display / Metered Manual Scale	Full numeric display / Metered Manual Scale	Full numeric display / Metered Manual Scale ± symbols
	D-o-F Preview / Eye-activated		●/●	●/—	—/—	—/—	—/—
Metering	Eva‹.Mel Segments/Focus point Link		6/●	6/●	3D-8/—	5/—	8/●
	Partial Metering		●	●	● (SPOT)	● (SPOT)	●(SPOT)
	Average Metering		●	●	●	—	Âl
	Metering Range (EV @ 20℃)		1 – 20	-1 – 20	-1 – 20	0 –19	0 – 20
Exposure Control	Shutter-priority AE		●	●	●	●	●
	Aperture-priority AE		●	●	●	●	●
	Depth-of-Field AE		●	●	—	—	—
	Manual		●	●	●	●	●
	Intelligent Program AE / Shiftable		●/●	●/●	●/●	●/●	●/●
	Bar Code Program / Card		—/—	●(5)/●	—/—	—/—	—/●
	Programmed Image Control		●(4)	●(4)	●(8)	—	—
	Anti-Camera Shake Program		—	● (Full Auto Mode)	—	—	—
	Flash Exposure System		E-TTL, A-TTL & TTL	A-TTL & TTL	3D multi BL	TTL	TTL
	FE Lock		●	—	—	—	—
	Exposure Comp.	AEB	●	●	●	●	♦Card
		SB-AEB	—	—	●	—	—
		MANUAL(EV)	● (± 2)	● (± 2)	● (± 5)	● (± 5)	● (± 4)
	AE Lock › Auto/Manual		●/●	●/●	●/●	●/●	●/●
	Multiple Exposure (Preset)		●	●	—	—	♦Card
Shutter Speed	Range (Increments)		1/4000—30(1/2)	1/4000—30(1/2)	1/4000 — 30(1/3)	1/2000 — 30(1)	1/2000 — 30(1)
	X-sync Speed		1/125	1/125	1/125	1/125	1/90
Film Transport (24 exp. roll)	Fully Automatic / Silent Transport		●/●☆☆	●/●☆	●/●	—/—	●/—
	Winding Speed (fps)		2.5	3	3.7	2	1
	Rewind Speed (sec.) / Automatic		6/12(Silent) / ●	II/ ●	12/16(Silent) / ●	19/ —	I2 / ●
	Battery Life AE100 O/AE50.FA50		90/35	100/30	150/30	112/	55/20
Built-in Flash	Auto Pop-up / Auto Retraction		●/—	●/—	—/—	—/—	●/●
	Manual ON/OFF possible		●/●	●/●	●/●	●/●	●/●
	Coverage (mm)		28	28 — 80	28	28	28 — 80
	GNo.(ISO100, meters)		13	12 — 17	14	13	14 — 17
	Auto Low-Backlight Flash		●	●	—	—	●
	Flash Exposure Compensation		●	●	●	●	—
	Second-curtain Sync		●	●	●	●	—
	REcycle time (sec.)		2	2	3		2.5
	Red-eye Reduction		● (Lamp)	● (Lamp)	● (Lamp)	—	● (Preflash)
External Display / User Interface			LCD/Control Dials (2)	LCD/Control Dials (2)	LCD/Control Dials (2)	LCD/Control Dials (2)	LCD/Up-Down Keys
Panorama Mode			Externally switchable	Externally switchable*	Externally switchable	—	Externally switchable**
Custom Functions (Number)			●(12)	●(7)	—	—	●(card)
Wireless Remote Receiver			●	●	—	—	—
Wired Remote Terminal			●	—	●	●	●
Wireless Flash			—	—	—	—	●
Normal / Panorama Date			●/●	●/●(Nov. 93)	●/—	●/—	●/●(Nov. 92)
Metal Exterior			●	—	—	—	—
Internal Power Source			2CR5	2CR5	DL123A or CR123A x2	DL223A or CR-P2	2CR5
Dimensions [WxHxD] (mm)			152.5 x 104.5 x 71	154.2 x 105.0 x 69.1	151x 103 x 71	154.5 x 100 x 67	152.5 x 99 x 68.5
External Battery Pack			Size AA or 2CR5	—	—	—	—
Weight (grams)			595	580	600	660	540
Marketed (in Japan)			'95.9	'91.10('93.11)	'94.11	'90.9	92.04('92.11)

*: Added Nov. 93

**: Added NOv. 92

9. PRECAUTIONS

No. Cautions and *Supplementary Remarks*

1. In the Full Auto and Programmed Image Control modes, the settings shown on the AF mode dial, metering mode dial, and film transport mode dial may differ from the actual modes set by the camera.
   In the Full Auto and Programmed Image Control modes, the AF mode, metering mode, and film transport mode are set automatically. Although the mode dials can still be rotated to any setting, it will be overridden.

2. When the lens' focus mode switch is set to M, manual focus will be set, but the AF mode dial will always indicate an AF mode. This may look contradictory.
   As per the design.

3. After the number of multiple exposures is preset and the first exposure is taken, cancelling the multiple exposure operation before the preset number is taken will trigger the mirror to flip up and down once. The film is not exposed during this reflex action.
   As per the design.

4. When the built-in flash is used, any lens hood must be detached.
   An attached lens hood will obstruct part of the flash coverage.
   Use an external flash unit.

5. The built-in flash's maximum coverage corresponds to 28mm lenses. Therefore, if the lens is wider than 28mm, there will be light fall-off at the edges.
   To obtain wider flash coverage, use Speedlite 380 EX, 540EZ, 430EZ, or 420EZ.

6. While the built-in flash is being used or recharged, the electronic manual focusing ring on USM lenses cannot be used.
   The camera design does not allow power to be supplied to the built-in flash and lens at the same time.

7. When a Programmed Image Control mode is used with an external flash unit, the desired effect cannot be obtained. Therefore, using an external flash unit is not recommended.
   When on, an external flash unit will always fire and the flash exposure will be controlled by the A-TTL or TTL program instead of the Programmed Image Control mode.

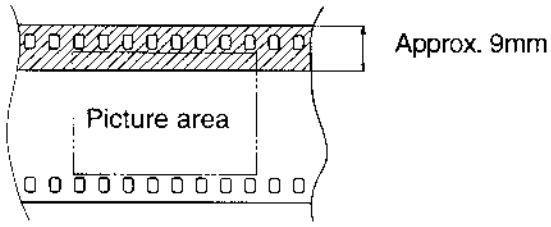
8. With the focusing point camera-selected and the AI Servo AF and continuous shooting modes set, the shooting speed may become irregular when the subject moves to another focusing point.
   During the instant when the subject moves from one focusing point to another, focusing will be

impossible. The time required for refocusing causes the irregular shooting speed. This also occurs on the EOS 10S.

9. Infrared film cannot be used.

The camera's photo reflector emits infrared light to detect the film perforation. Infrared film will therefore be fogged. This also occurs with the EOS A2/A2E.

As illustrated, about 9 mm of the film from the top edge will be ruined by the infrared light. About 15 percent of the rest of the film area will be fogged to some extent.



10. If AEB has been set and exposure compensation is set to an amount beyond the exposure level scale, the AEB and exposure compensation will function properly. However, the exposure level scale will appear as shown below.

Indicates AEB amount of ±1 stop.

Indicates maximum AEB amount.

Indicates an AEB amount which exceeds the maximum amount by 0.5 stop.

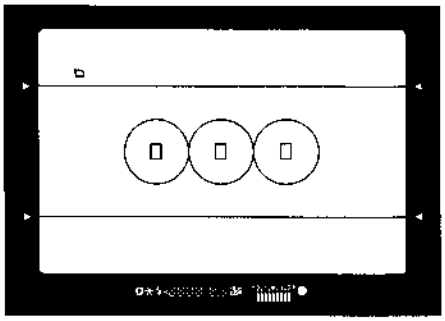
Indicates an AEB amount which exceeds the maximum amount by 1.5 stops.

Indicates an AEB amount which exceeds the maximum amount by 2 stops.

11. The partial metering areas are not marked on the viewfinder screen.

To avoid excessive clutter, the three partial metering areas have not been marked on the screen.

The partial metering area is circular, centered on each focusing point. As shown below, they have the same diameter and they do not overlap.



12. Instead of firing a preflash with the 380 EX during depth-of-field preview executed with the AE lock button (Custom Function F-4 set to 2) or with the eye, revert to the maximum aperture first. Then fire the preflash and main flash.

As per the system design.

13. When Custom Function No. F-4 is set to 1 or 2, FE lock will be disabled.

As per the design.

<MEMO>

Part 2

Technical Information

1. TECHNICAL DESCRIPTION (OPTO-MECHANICAL)

1.1 Eye-Controlled Autofocus

The EOS 50 / ELAN II features an improved version of the Eye-Controlled Autofocus found in the EOS 5/A2E. The EOS 50 / ELAN II's Eye-Controlled Autofocus is faster, more precise, and more feature-laden. The focusing point selection and depth-of-field preview methods are basically the same as in the EOS 5/A2E. Table 2-1 shows the differences in features compared to the EOS 5/A2E.

Table 2-1 Comparison of Eye-Controlled Autofocus

(❑: Provided ×: Not provided)

Item	EOS 55	EOS5
Horizontal compatibility	❑	❑
Vertical compatibility	❑	×
Horizontal Calibration	❑	❑
Vertical Calibration	❑	×
Calibration Settings	3	5
Eye-Controlled Servo AF	❑	×
Eye-Controlled DEP	❑	×
Response time	Approx. 120ms	Approx. 250ms
Sensor type	Area BASIS	CCD
Pixels	7000	6000

- Eye-Controlled Servo AF: When Eye-Controlled Autofocus and AI Servo AF are both set and the shutter button is pressed halfway or continuous shooting is executed, AI Servo AF (predictive AF) can track an approaching (or retreating) subject moving across the three focusing points while the eye tracks the subject. This is made possible by the focusing point covering the subject and the autofocusing information obtained from it.
- Eye-Controlled Autofocus depth-of-field AE (See 1-3)
- As with the EOS 5/A2E, "self-learning" calibration is used. (Both horizontal and vertical calibration data can be registered under the same calibration channel.)

Table 2-2 shows the compatibility of Eye-Controlled Autofocus with the exposure modes.

Table 2-2 Eye-Controlled Autofocus / Exposure Modes Compatibility

Exposure Mode	P	TV	AV	M	DEP	▢				
Focus point selection	○	○	○	○	○	×	○	○	○	○
Depth-of-field preview	○	○	○	○	○	×	×	×	×	×

1) Eye-Controlled Autofocus System Components

Figure 2-1 shows the basic components of the Eye-Controlled Autofocus system. Infrared-emitting diodes (IRED) illuminate the eye. The IR reflected from the eye enters the camera where the dichroic mirror reflects it upward to a condenser lens through which an image of the eyeball is projected on the Eye-Controlled Autofocus BASIS.

Although this camera has a different optical system layout, a dichroic mirror, a BASIS instead of a CCD, and more IREDs (8 instead of 4), it retains the basic principles used in the EOS 5/A2E.

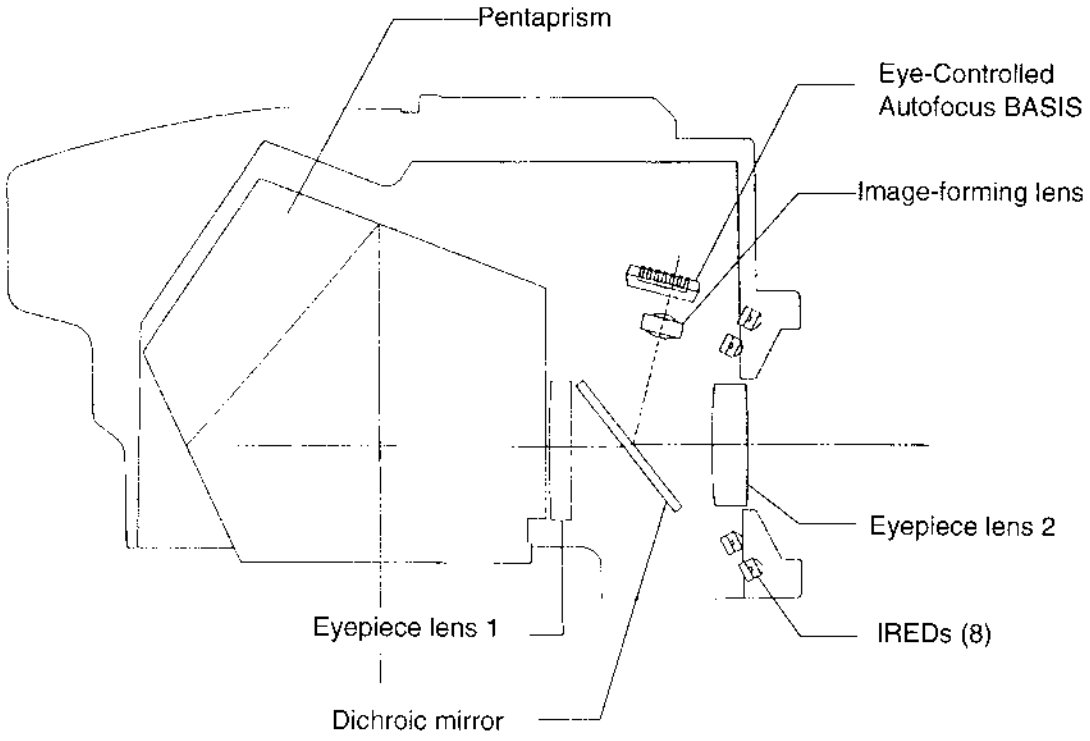


Fig. 2-1 Eye-Controlled Autofocus system

- Dichroic mirror: Serves the same function as the beam splitter in the EOS A2E. It has a special coating which reflects only infrared wavelengths. It directs the infrared wavelengths to the Eye-Controlled Autofocus BASIS and passes the visible light straight through to the eyepiece.

Figure 2-2 shows the components of the Eye-Controlled Autofocus unit.

As shown in Fig. 2-3, the infrared illumination system has eight infrared-emitting diodes (IREDs) on the eyepiece frame. They emit an infrared wavelength of 880 nm. As shown in Table 2-3, the IREDs function to detect whether eyeglasses are worn and whether the picture is framed horizontally or vertically.

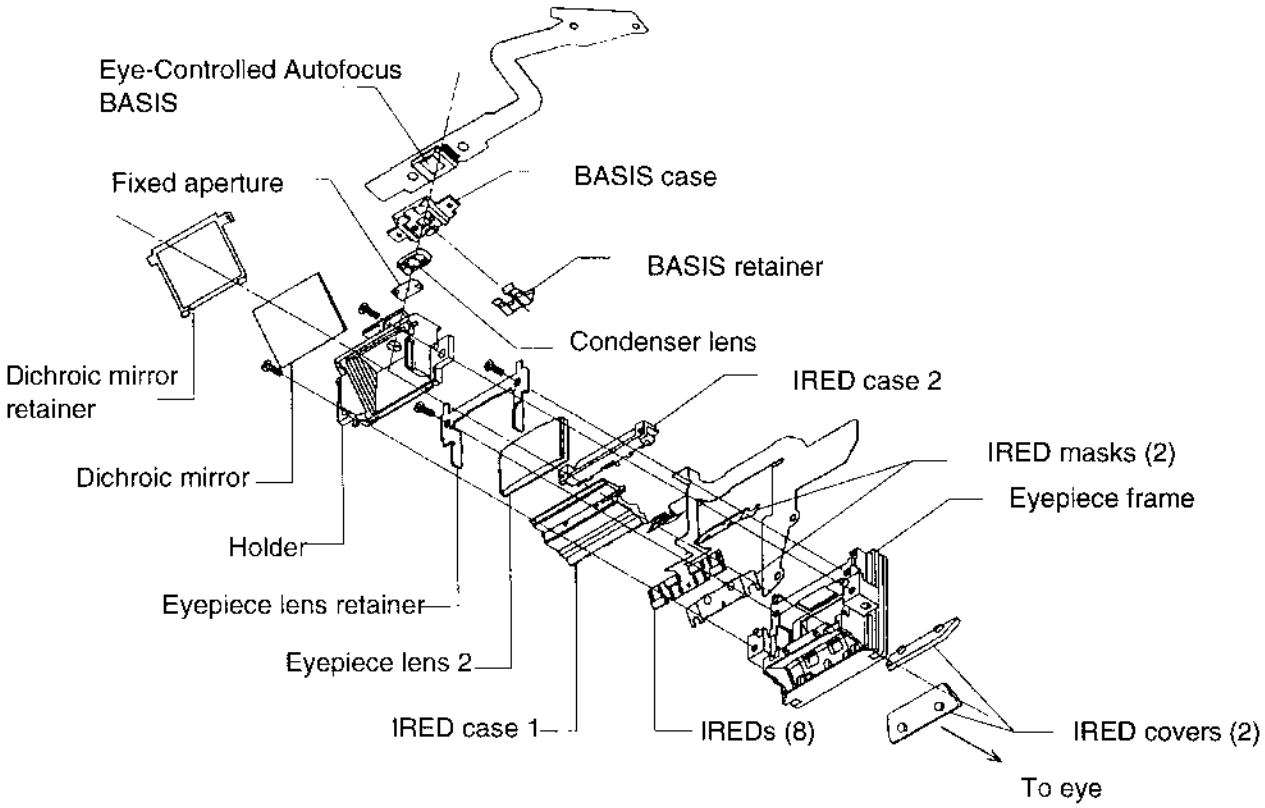


Fig. 2-2 Components of the Eye-Controlled Autofocus unit

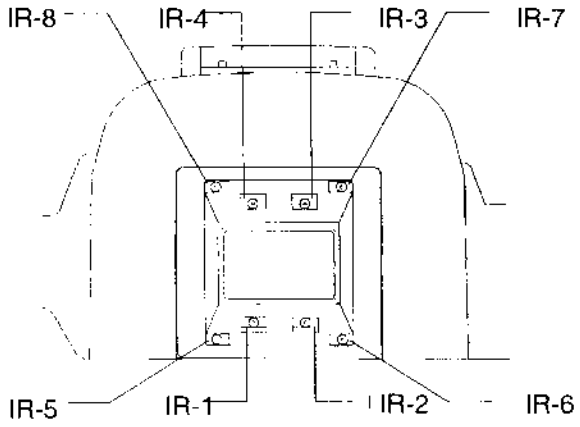


Fig. 2-3 IRED illumination system

Table 2-3 Camera orientation and IRED activation

↓Orientation/Eyeglass Use →		Without Glasses	With Glasses
Horizontal	Upright	IR-1 / IR-2	IR-5 / IR-6
	Upside down	IR-1 / IR-2	IR-5 / IR-6
Vertical	Grip on top	IR-1 / IR-4	IR-5 / IR-8
	Grip on bottom	IR-2 / IR-3	IR-6 / IR-7

2) Horizontal or Vertical Orientation

The camera's orientation is detected by optical orientation switches (same as EOS 5/A2E) fitted on each side of the eyepiece. As shown in Fig. 2-4, a steel ball rolls between an LED and LED sensor. In the horizontal shooting position, light emitted by the LED in both switches 1 and 2 is blocked by the ball (indicated by ● when closed). However, when the grip is turned upward, the ball in switch 2 rolls down, allowing the LED sensor to sense the emitted light (indicated by O when open). In this way, the open-and-close combinations enable the camera to detect orientation.

The ball's path inclines by about 15° from an upright position. Therefore, when the camera is upright, both switches are closed, and when the camera is upside down, both are open. Horizontal orientation is detected in both cases.

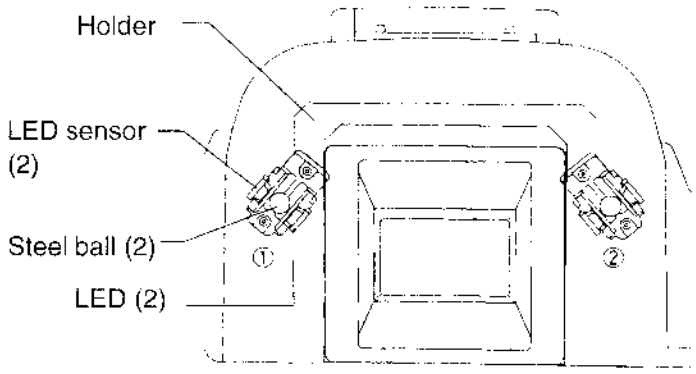


Fig. 2-4 Camera Orientation Switches

Table 2-2 Orientation detection

↓Orientation / Switch →		①	②
Horizontal	Upright	●	●
	Upside down*	○	○
Vertical	Grip up	●	○
	Grip down	○	●
* Calibration disabled.			

3) Improved Response

With improved CPU performance, a different Eye-Controlled Autofocus sensor (Eye-Controlled Autofocus BASIS instead of a CCD), and a revamped Eye-Controlled Autofocus algorithm, the Eye-Controlled Autofocus and calculation times have been shortened to about half that of the EOS 5/A2E. (120ms vs 220ms). This improved speed contributes to easier picture-taking and expands photographic possibilities.

4) Vertical Eye-Controlled Autofocus

The EOS 5/A2E could not adequately detect the edge of the pupil when the camera was vertical. Vertical Eye-Controlled Autofocus was therefore not provided. In this camera, more precise pupil edge detection and the incorporation of vertical-orientation calibration have made vertical Eye-Controlled Autofocus possible.

5) Eye-Controlled Autofocus BASIS

To attain precise, high-speed eye-controlled operation, a new BASIS area sensor developed by Canon has been incorporated.

Replacing the EOS 5/A2E's CCD with the new BASIS enabled high-speed and high-precision eye-controlled operation with less power:

a. The drive logic section and signal-processing circuit have been integrated in the BASIS to save space.

b. The power requirement of only 5 V has cut power consumption to 1/6 of what the EOS 5/A2E's CCD required (which was 18 V).

c. Signal reading speed is twice as fast as the EOS 5/A2E's CCD.

1.2 AF System

The camera uses the same multi-BASIS (cross-type sensor at center flanked by vertical line-sensitive sensors) found in the EOS 500/Rebel X. Its three focusing points give a wide focusing area. The focusing point can be eye-selected (horizontally or vertically), dial-selected, or camera-selected.

There are four focusing modes: One-Shot AF, AI Focus mode (switches automatically between One-Shot and AI Servo AF), AI Servo AF, and manual. The AF mode is set directly with the AF mode dial on the right shoulder of the camera. The AI Focus mode, which could be set automatically only in the Full Auto mode with the EOS 5/A2E, can be set with any Creative Zone mode in this model.

Table 2-5 compares AF performance of the EOS 5/A2E and EOS 55 / 50 / ELAN II E.

Table 2-5 Comparison of AF performance

(O: Provided X: Not provided)

	Item		EOS 55 / 50 / ELAN II E	EOS 5
Focusing points			3	5
AF sensor type			I + I	II + II
Focusing point selection	Eye-Controlled Autofocus	Horizontal	○	×
		Vertical	○	○
	Camera-selected		○	○
	Manually-selected		○	○
Focusing speed			Identical to EOS 5	
Precision			Identical to EOS 5	
Low light limit			0 EV	0 EV
Predictive AF control	Eye-Controlled Autofocus		Eye-Controlled Servo AF	Eye-selected focus point
	Camera-selected		Center focus point selected shiftable to other points	
	Manually-selected		Selected focusing point	
Built-in AF Illuminator	Focus point compatibility		3	5
	Effective range	Center	6.5m	7m
		Off-center	4m	3.5m
	Coverage		Covers 28mm to 135mm lenses.	

- Built-in AF-Illuminator: When the camera is used with the 540EZ (which is equipped with a focusing point-linked AF-Illuminator), the 540EZ emits the AF-Illuminator automatically when required. When the camera is used with other EZ-series Speedlites or with the 160E, the camera emits the AF-Illuminator automatically when required. The Speedlite automatically emits the AF-Illuminator only if the center focusing point has been manually selected with the Main Dial.

1) Focusing System Components

The basic autofocusing optical system, focusing unit construction and multi-BASIS are the same as the EOS 500/Rebel X's. The BASIS is designed to work with $f/5.6$ and faster lenses.

As shown in Fig. 2-5, part of the light passing through the camera lens and beam splitting mirror (40% transmittance) is reflected by the piggy-back sub mirror (100% reflectance) downward at 83°. The light subsequently passes through the field lens, reflects off the AF mirror, and goes through the infrared filter, fixed aperture, and secondary image-forming lens before reaching the multi-BASIS.

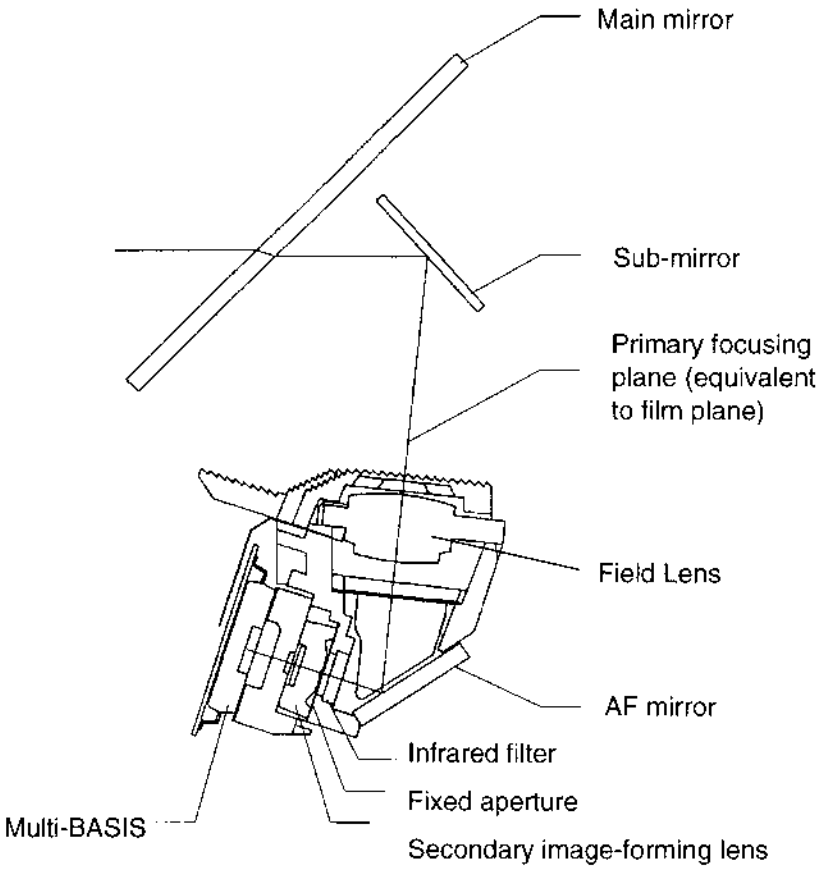


Fig. 2-5 AF optical system

Fig. 2-6 shows the focusing points in the viewfinder and the respective type.

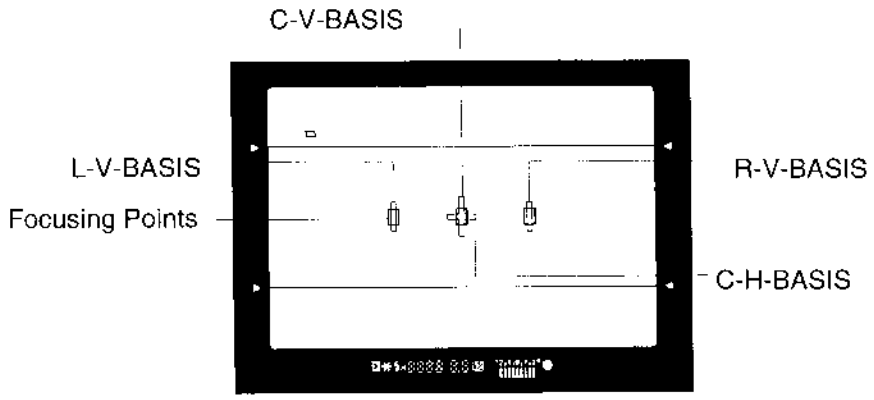


Fig. 2-6 Focusing Point Sensors

2) AF Sensor and Multi-BASIS

The multi-BASIS uses a cross-type sensor like the EOS 500/Rebel X's multi-BASIS. It also uses the same control system to improve focusing performance for low-contrast subjects. It enables focusing of very low contrast 90:80 subjects.

3) Faster Focusing Calculation and AF

1. Faster AF
   With a clock speed of 16 MHz and a minimum access time of 0.0625 µs, the super microcomputer enables high-speed calculations. The AF speed is consequently faster than the EOS 5/A2E's.

2. Calculation process
   In the One-Shot AF mode with automatic focusing point selection, the calculation speed is the same as with the EOS 5/A2E.

   In the AI Servo AF mode with automatic focusing point selection and predictive AF, the calculation speed is the same as with the EOS 5/A2E. Since the center focusing point is given priority, the subject must be placed at the center of the viewfinder for autofocusing. The left and right focusing points are on standby all the while. So if the subject moves to the left or right focusing point, the respective focusing point takes over for AI Servo AF. When Eye-Controlled Autofocus is used, Servo AF applies.

   With an EF 300mm *f*/2.8 lens attached, the predictive AF feature can track a subject moving toward the camera at 40 km/h down to a distance of *12* meters.

   In the AI Focus mode, either the One-Shot AF or AI Servo AF mode is used.

4) AF-Illuminator

The camera body has a built-in AF-Illuminator which links to all three focusing points. (The AF-Illuminator can be disabled with Custom Function No. 7.) It throws a horizontal-line pattern, which is effective for the vertical BASIS sensors.)

Figure 2-7 shows the AF-Illuminator's optical system. Unlike the EOS 10S and EOS 5/A2E which used a patterned LED for multiple focusing points, the EOS 50 / ELAN II has an AF-Illuminator divider panel coupled with an external panel. The Illuminator divider panel is in front of the light pattern which is geared to illuminate only the center focusing point area. The same system is used by the EOS Elan and EOS 1000N/Rebel II. The AF-Illuminator covers the area of a 28mm lens.

When an external flash unit is used and it has an AF-Illuminator, the higher performance AF-Illuminator is used as follows:

- With the 540EZ (multiple-point AF-Illuminator provided): The 540EZ's AF-Illuminator is emitted automatically and the camera's AF-Illuminator is never used.
- With other EZ-series Speedlites and the 160E: The camera's AF-Illuminator is used. The Speedlite's AF-Illuminator is emitted automatically only when the center focusing point has been selected with the Command Dial.

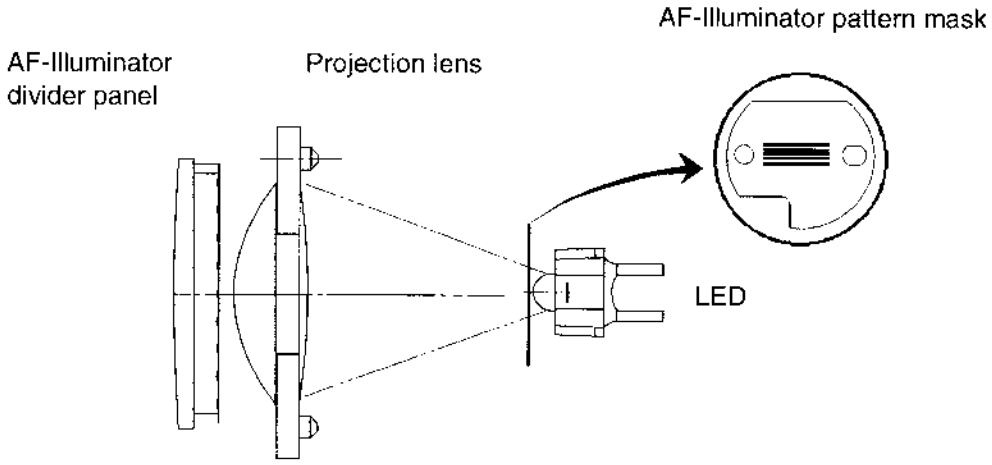


Fig. 2-7 AF Illustrator optical system (top view)

1.3 Exposure Control System

1) Configuration

1. Optics and Sensors

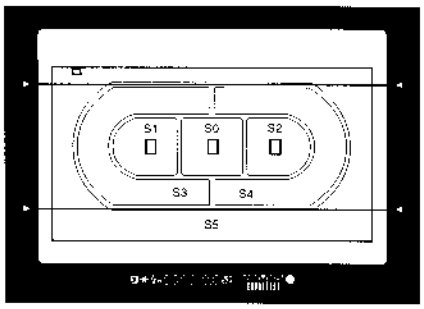


Fig. 2-8 Evaluative metering zones

The metering sensor which has been vertical above the eyepiece lens is now horizontal just above the pentaprism's rear face (with a mirror as an intermediary) so that it does not obstruct the Eye-Controlled Autofocus unit.

The same 6-zone metering sensor and 4–zone flash metering sensor as in the EOS 500/Rebel X are used. The 6-zone metering sensor enables evaluative, partial, and centerweighted averaging metering. Also, with Speedlite 380EX, developed with the camera, E-TTL flash photography which links evaluative flash metering to the focusing point is possible. For TTL flash metering, the 4-zone flash metering sensor is used for off-the-film metering.

2. Metering modes and metering patterns

   a. Evaluative metering (Focusing point-linked, 6-zone evaluative metering)

   Evaluative metering,uses the same sensor and algorithm as the EOS 500/Rebel X. The three focusing points correspond to metering zones S0, S1, and S2. The evaluative metering zone is linked to the active focusing point. During manual focus, evaluative metering is always based on the center focusing point. No correction is provided for differences in horizontal and vertical camera position.

   Figure 2-9 shows the metering zones for the respective focusing point and their weighting. Figure 2-11 shows the sensitivity pattern for each metering zone.

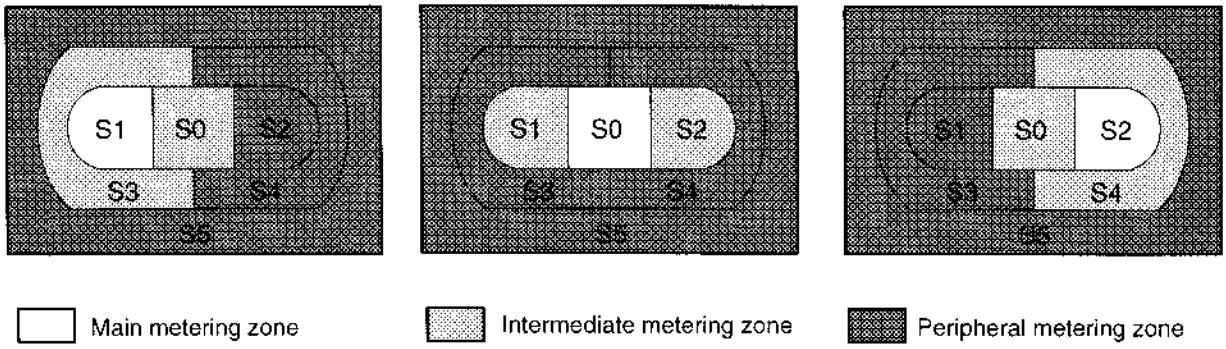


Fig. 2-9 Metering zones and their weighting

   b. Partial metering

   With the EOS 500/Rebel X, partial metering with the center metering sensor (S0) was enabled only with AE lock. However, with the EOS 50 / ELAN II, partial metering can be linked to the 6-zone metering sensor's S0, S1, and S2 zones. In a Creative Zone mode, you can set the partial metering zone directly with the metering mode lever.

   Normally, partial metering is linked only to the center metering zone. However, in response to users who want to link partial metering to any focusing point, Custom Function No. 8 has been provided to enable partial metering to be linked to the dial- or eye-selected focusing point. (If the focusing point selection is automatic, partial metering is linked to the center focusing point only.)

During manual focus, partial metering can be linked to a focusing point only when the focusing point is user-selected.

c. Centerweighted averaging metering

Like the EOS 500/Rebel X, centerweighted averaging is based on the reading of the entire 6-zone AE sensor.

Fig. 2-10 Center-weighted average pattern

d. Off-the-film flash metering

When this camera is used with the built-in flash, ML-3, 300TL, 380EX, or a multi-flash setup with any of these flash units, it uses TTL autoflash metering. If a Speedlite older than the 380EX is used, the camera uses A-TTL autoflash metering. The TTL and A-TTL autoflash metering systems both use the same metering sensor and algorithm as the EOS 500/Rebel X. Autoflash metering is linked to the three focusing points to detect the main subject and to weight the flash exposure accordingly. Figure 2-12 shows the off-the-film flash metering pattern.

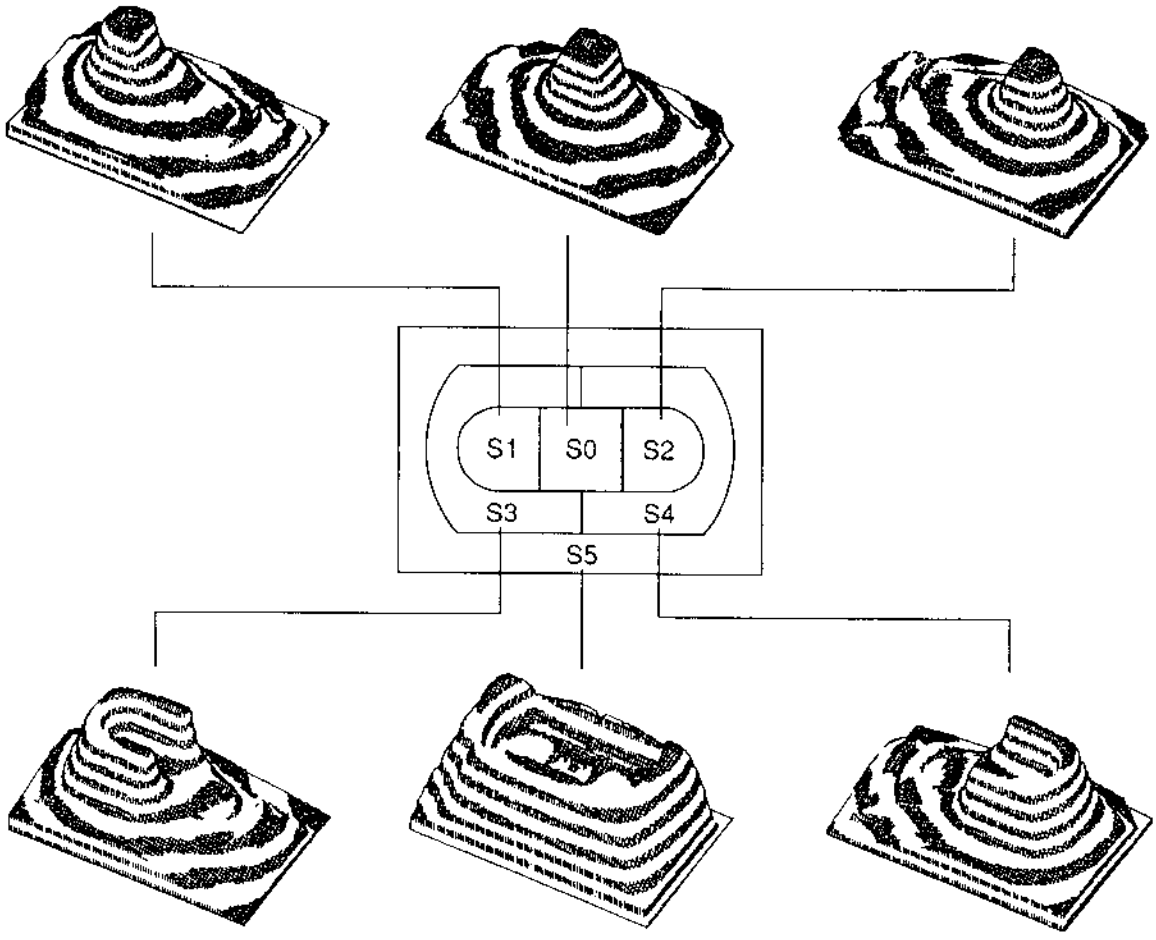


Fig. 2-11 Evaluative metering zone patterns

e. Ambient light metering in TTL and A-TTL autoflash modes

The flash aperture for TTL and A-TTL autoflash metering described in d above is set to suit the ambient light as metered by the respective exposure mode (evaluative [no automatic exposure compensation], partial, or centerweighted averaging metering).

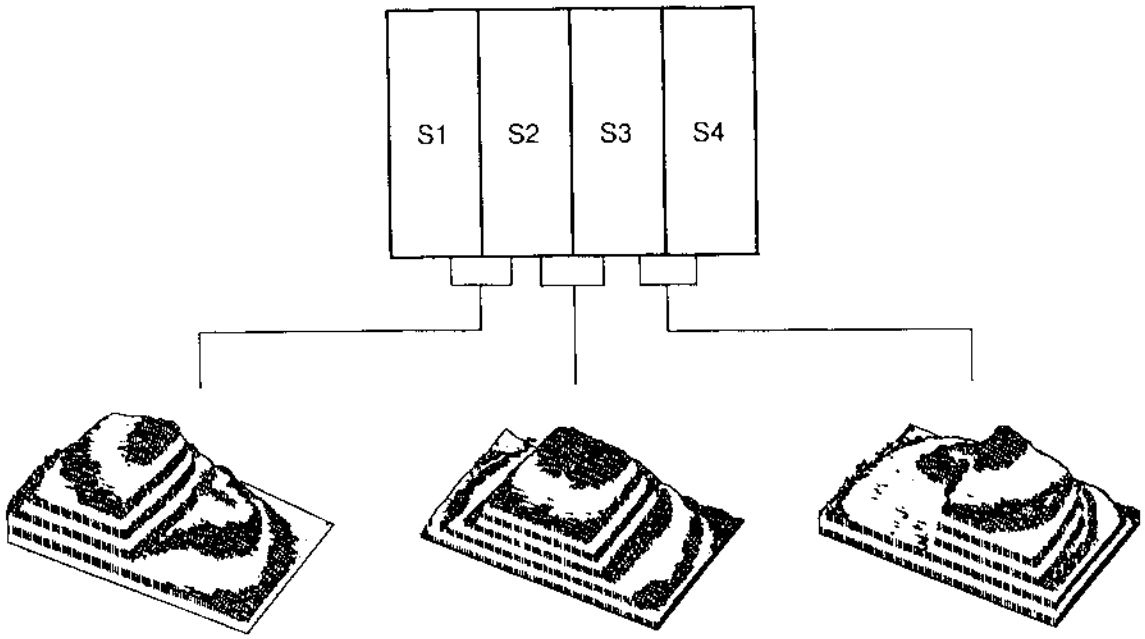


Fig. 2-12 Off-the-film metering pattern

2) Exposure Control

1. AE control

Except for Sports mode (whose program has been changed) and Depth-of-field AE (eye-control compatible), AE control is basically the same as with the EOS 5/A2E.

a. Sports mode

To freeze moving subjects, this mode sets a fast shutter speed with Shutter-priority AE and continuous focus tracking. It sets the camera to AI Servo AF, automatic focusing point selection or Eye-Controlled Autofocus, continuous shooting, evaluative metering, and high-speed program AE. The built-in flash is disabled.

The PH-1 mode is based on using an EF 50mm f/1.8 lens. Starting at maximum aperture, only the shutter speed shifts (faster speeds) until +2.5 EV steps beyond the speed where the camera-shake warning is given. The program then shifts both the shutter speed and aperture at a rate of 1:2 (Tv:Av) stops.

When other lenses are used, the program line is based on the lens' focal length and maximum aperture to attain a fast shutter speed and depth of field under bright conditions. From the point +2.5 EV steps beyond the speed where the camera-shake warning is given, the program line shoots upward as both shutter speed and aperture shift.

b. Depth-of-field AE

(1) With a camera-selected focusing point: Like the EOS 650, the two DEP points are specified with the center focusing point.

(2) With a dial-selected focusing point: Like the EOS 650, the two DEP points are specified with the dial-selected focusing point. (After the first DEP point is specified, a different focusing point cannot be used to specify the second DEP point.)

(3) With an eye-selected focusing point: The two DEP points can be specified by an eye-selected focusing point. The exposure is set by the current exposure mode when the shutter button is pressed halfway the third time. The exposure for evaluative or partial metering (Custom Function No. 8 set to 1) is weighted around the eye-selected focusing point when the shutter button is pressed halfway the third time.

2. AE lock

In the One-Shot AF mode and or the AI Focus AF mode's One-Shot AF mode, autoexposure is locked automatically when focus is achieved. Also, the AE lock button can be used to lock the autoexposure in any metering mode. The AE lock is effective for four sec. after the AE lock button is released. Each time the AE lock button is pressed, it locks the current AE setting. In the manual exposure mode, pressing the AE lock button starts the metering. To cancel, wait until the AE lock turns off or turn the metering mode dial or press the flash button. When the 380EX is used, the AE lock button functions as an FE lock button. This will be covered later.

3. Exposure compensation

With autoexposure bracketing (AEB) and manual exposure compensation, the exposure can be adjusted up to ±2 stops in half stops. When AEB is set, a bracketing sequence of correct exposure, underexposure, and overexposure can be shot singly or continuously depending on the film advance mode. In the manual exposure mode, exposure compensation can be set with the Quick Control Dial.

4. Manual exposure

Like the EOS 5/A2E, the Main Dial sets the shutter speed and the Quick Control Dial sets the aperture. Metered manual is used. (USA versions use +/- symbols instead of the exposure level scale.)

5. Flash exposure compensation

Flash exposure compensation with the built-in flash works in the same way as with the EOS 5/A2E. With the built-in flash popped up, press the Function button to set the flash exposure compensation mode. Then turn the Main Dial and Quick Control Dial to set the flash exposure compensation amount. The flash exposure compensation amount can also be set with an external flash unit. When flash exposure compensation is set with an external flash unit attached to the camera on the hot shoe or with the TTL Hot Shoe Adapter, it overrides any flash exposure compensation amount set with the camera. If multiple flash units are used, flash exposure compensation can only be set with the camera.

6. Shutter

This is the same shutter unit found in the EOS Elan. The shutter design specifications are also the same.

1.4 Film Transport

1) Overview

The film transport system uses a single motor (the same M1 coreless motor used by the EOS 5/A2E). By running in the normal or reverse mode, it performs the operations shown in Table 2-6.

The motor performs these operations by having its driving power distributed according to where the phase cam stops. During standby, the built-in flash pop-up phase is set. This keeps the built-in flash ready to pop-up before the exposure is made.

The process from autoloading to film rewind is described below.

1. Auto film loading

After the film is loaded and the camera back is closed, the camera reads the film's DX code. The motor runs in the normal mode (3) and sets the film advance phase. The motor then runs in reverse (2) to start autoloading. After the photo reflector detects 28 perforations, the motor stops. The motor runs in the normal mode (3) and sets the built-in flash pop-up phase and completes the autoloading. The frame counter on the LCD panel indicates "1".

Table 2-6 Motor Functions

Motor Mode	Operation
Normal	(1) Mirror lifting (2) Shutter cocking / mirror down (3) Mechanical phase switching
Reverse	(1) Film Rewind (2) Film Advance (3) Flash pop-up

2. Shutter release

When the shutter is tripped, the motor runs in the normal mode and the following occurs: The mirror goes up (1), the exposure is controlled, the shutter is cocked (2), and the motor stops after setting the film advance phase. Then the motor runs in reverse (2) and advances the film by one frame (8 perforations). Next, the motor runs in normal mode (3) to set the built-in flash pop-up phase.

3. End of roll detection and automatic film rewind

After 36 exposures are taken or when the film runs out, the film starts to rewind automatically. Before auto rewind starts, the motor runs in normal mode (3) and the mirror's reflex action occurs once and the film rewind phase is set. When the motor runs in reverse (1), film rewind starts.

4. Film rewind completion and return to standby mode

During film rewind, the film perforation is detected. After the frame count of 0 is detected and a preset delay elapses, the motor stops. Then the motor runs in normal mode (3), the built-in flash pop-up phase is set. The rewind operation is thereby completed.

* If Custom Function No. 2 has been set to 1, the preset delay after the frame count 0 is shortened so that the film leader is left outside the film cartridge.

2) Phase Determination

Phase detection is performed by the mechanical cam lever on the charge cam gear and the cam gear phase contacts contacting the phase pattern (CMSP1, CMSP2, CMSP3) sending the phase signal to the motor, which operates in the clockwise direction.

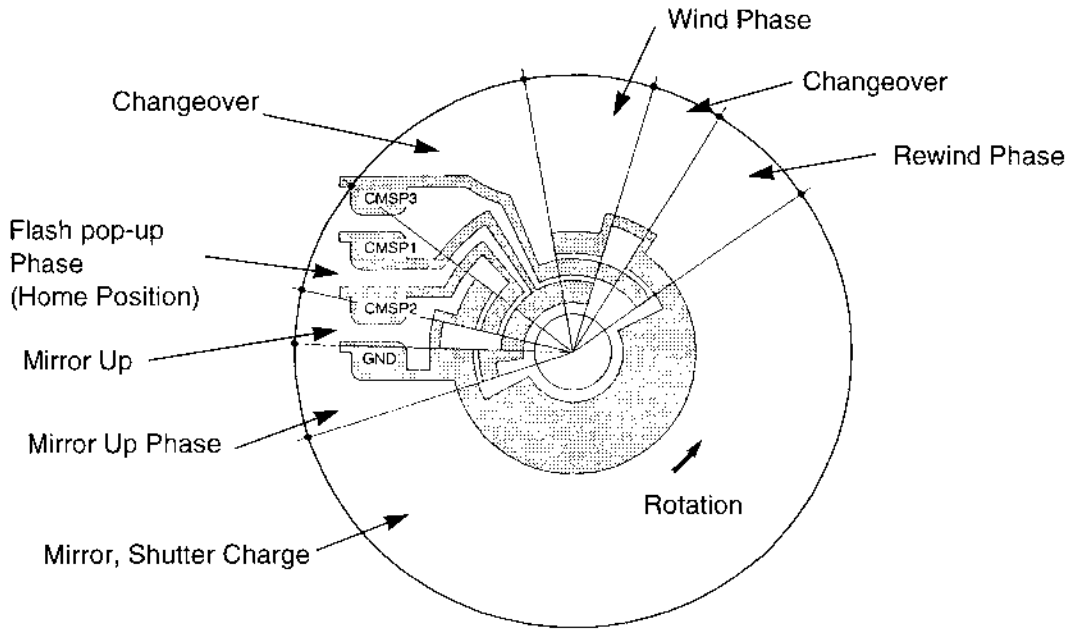


Fig. 2-13 Phase Circuit Board

3) Silent Film Transport

The basic construction is the same as with the EOS 100/Elan. Like the EOS Elan, the motor is controlled through pulse width modulation (PWM) even for film rewind. As a result, film rewind is ultra-silent.

Although this might be repetitious, the features are as follows:

① Coreless motor: Smooth rotation with little vibration and operation noise.

② Film advance timing belt: The rubber's anti-vibration properties greatly reduce film advance noise.

③ Film rewind timing belt: The rubber's anti-vibration properties makes film rewind noise very soft.

④ Film transport unit's floating support: The rubber's anti-vibration properties prevent the film transport unit's vibration from resonating noise through the body.

⑤ Ultra-silent film rewind with PWM control: The motor's low-speed control keeps noise very low.

Due to the above features, film advance noise is 55 dB and silent film rewind is 42 dB (as with the EOS 5/A2E). In the fast film rewind mode, it is 42 dB (as with the EOS 100/100/elan). Thus, film transport is very silent.

Figure 2-14 shows the film rewind system's silencing technology.

4) Autoloading, DX Code and ISO Film Speed Setting

Same as with the EOS 5/A2E.

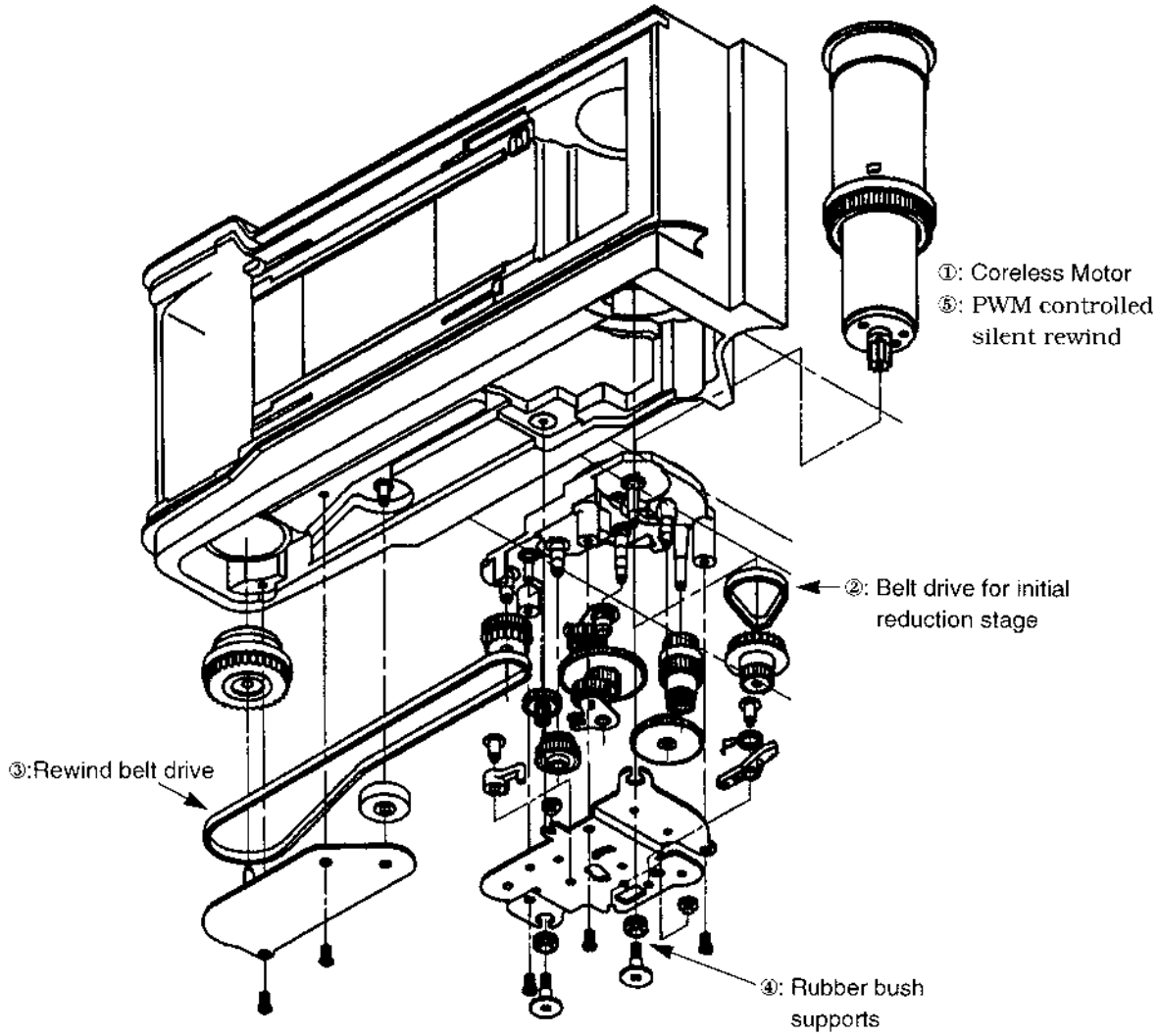

①: Coreless Motor
⑤: PWM controlled silent rewind
②: Belt drive for initial reduction stage
③:Rewind belt drive
④: Rubber bush supports

Fig. 2-15 Film rewind system's silencing technology

1.5 Built-in Flash

1) Overview

The built-in flash's pop-up operation is driven by the motor. (The flash is retracted manually.) Three-zone TTL auto flash exposure control, red-eye reduction, and other basic features are the same as with previous EOS cameras.

Table 2-7 shows the built-in flash's recycling and pop-up timing.

Table 2-7 Built-in flash recycling and pop-up timing.

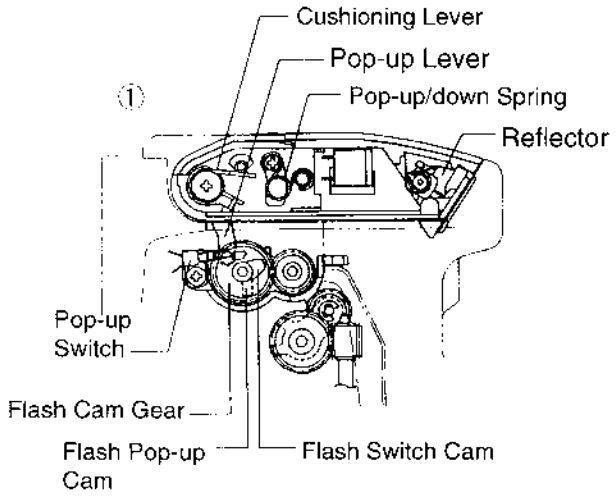
Exposure Mode	Recycling	Pop-Up	Retraction
Creative Zone	a. After flash button is pressed. b. After the flash fires	When flash button is pressed.	By hand.
Full Auto Portrait Close-up	a. When the exposure mode is set. b. Halfway pressing of shutter button c. After the flash fires.	After recycling, AF, and metering are completed, automatic pop-up when low-light or backlit condition is detected.	

2) Built-in Flash Optical System

To maintain compactness, it is almost identical to the EOS 500/Rebel X's built-in flash.

3) Red-Eye Reduction

A lamp is used for red-eye reduction. The lamp operates in the same way as the EOS 5/A2E's except that shutter release is given priority. The shutter can be released even while the lamp is lit.



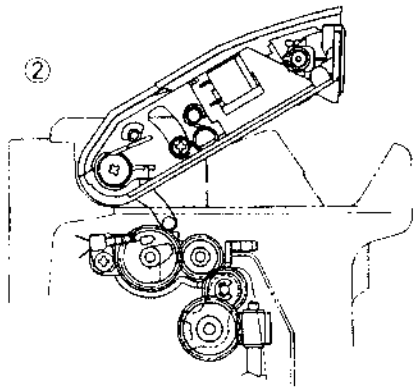


Fig. 2-15 Flash Pop-up

1.6 E-TTL Flash System

An E-TTL Flash System, which operates when the Speedlite 380EX is mounted on the EOS 50/55/Elan II is incorporated. This E-TTL Flash System is an improved version of the A-TTL auto flash exposure system. It features flash output control and automatic exposure control (ambient light exposure) to balance the flash and ambient light in daylight or at night.

The features of this E-TTL Flash System are as follows:

1. With the new evaluative flash metering system linked to the focusing points, the camera sets the flash exposure automatically (even when the framing is changed) for a variety of situations such as back-lit subjects, fill-flash, and indoor photography.

* For indoor flash photography in the Full Auto or Program mode, 1/60 sec. is the slowest synchronizing shutter speed that can be set. Therefore as with the current flash exposure system, the background behind the subject might be underexposed.

2. High speed synchronization (called FP flash) enables flash to be used with fast shutter speeds. It allows you to open up the aperture for fill-in flash to obtain blurred backgrounds for portraits. (Creative Zone)

3. For flash photography indoors or under low-light conditions, a slow shutter speed will be set automatically to obtain a balanced exposure between the subject and background. (Aperture-priority AE)

4. With FE lock (Flash Exposure lock), proper exposure even for spotlighted subjects is possible.

The E-TTL Flash System operates as follows: The Speedlite 380EX fires a preflash. The camera's six-zone flash metering sensor reads the ambient light immediately before the preflash is fired. It also reads the light reflected from the subject produced by the preflash. The difference in the lighting of the readings is used to calculate the flash output which is retained in memory. Table 2-8 compares the E-TTL Flash System with existing flash control systems.

Table 2-8 Comparison of Flash Control Systems

Item		E-TTL	A-TTL	TTL (Built-in Flash)
SW-1 ON (Shutter button pressed halfway)	Near infrared preflash	X	O	X
	Tv and Av	Set by brightness information from the metering sensor.	Set by brightness information from the metering sensor and the subject distance information from the near infrared preflash.	Set according to the brightness information obtained by the metering sensor.
	Preflash	O	X	X
SW-2 ON (Shutter button pressed completely)	Flash output	Set and held by the ambient light and preflash readings.	–	
	Start of front curtain, X-sync ON	The main flash is fired according to the calculated flash output that was retained.	Main flash is fired.	
	TTL-OTF metering		Flash sensor is used.	
	Flash termination		Flash stopped when flash exposure is proper.	
Fast Shutter Sync. (FP flash)		O	X	X
TTL flash exposure sensor		X	O	O

The E-TTL Flash System's major features backing the above points are as follows:

1. Improved AIM System: Unlike TTL off-the-film auto-flash metering, the six-zone metering sensor is fully utilized and linked to the focusing points. This enables more intricate flash output control for the subject.
2. Flash metering sensor unnecessary: Since the TTL evaluative flash metering system does not use off-the-film metering, it is not affected by differences in surface reflectance of different films. Flash metering is therefore more precise.
3. Better control: Since the flash output can be precalculated and retained, the proper flash exposure can always be obtained regardless of the camera-to-subject distance.
4. Fast shutter sync speed (FP flash): Since the flash output can be precalculated and retained, a normal flash duration is set for a sync speed of 1/125 sec. (X-sync) or slower. If the shutter speed is faster than the X-sync speed, the flash mode switches automatically to a high sync speed (FP flash). This enables the flash to synchronize automatically with all shutter speeds.
5. FE lock: Like the AE lock used with partial metering, the FE (flash exposure) lock feature locks the flash exposure reading obtained by the preflash reflecting off the subject. It enables sophisticated flash techniques.

Flash control with other EOS cameras is the same as before:

- With the built-in flash: Off-the-film metering with 3-zone TTL auto flash control linked to the focusing points.
- With an EZ-series Speedlite (540EZ, 430EZ, etc.): Off-the-film metering with 3-zone A-TTL auto flash control linked to the focusing points. The same effects are obtained as with the EOS A2/A2E and other cameras having multiple focusing points.
- With the ML-3 and other multiple flash unit systems: As with the built-in flash, 3-zone TTL auto flash control linked to the focusing points is used.

1) Basic Operation of E-TTL Auto Flash Exposure System

1. When the shutter button is pressed halfway:
   a. The EOS camera determines the flash aperture and shutter speed.
   b. The ambient light distribution is metered by the 6-zone metering sensor which is used to calculate the output of the main flash.
2. When the shutter button is pressed completely, the picture is taken with E-TTL Auto Flash Exposure Control based on the flash aperture set in step 1 above.
   a. Before the mirror flips up, the 6-zone metering sensor meters the ambient light instantaneously immediately before the preflash fires.
   b. Before the mirror flips up, the preflash fires and the reflected light is metered by the 6-zone metering sensor.
      - In steps 2-1 and 2-2, the light reflected off the subject from only the preflash is metered.
      - The ambient light distribution metered in 1-2 and the reflection of the preflash metered in 2-2 are used to calculate the main flash output which is then locked.
   c. The main flash is fired according to the calculated and locked output.

With the conventional TTL Auto Flash Exposure System, the flash is cutoff with a signal when the correct flash exposure level is attained. Excess charge remains after the flash is cutoff. In the case of the E-TTL Auto Flash Exposure System, the flash output setting obtained beforehand is used so the charge is equal to the required exposure. Therefore, correct flash exposure is obtained by firing at "full power" without the need to stop the flash with charge remaining in the capacitor. Flash control is therefore improved.

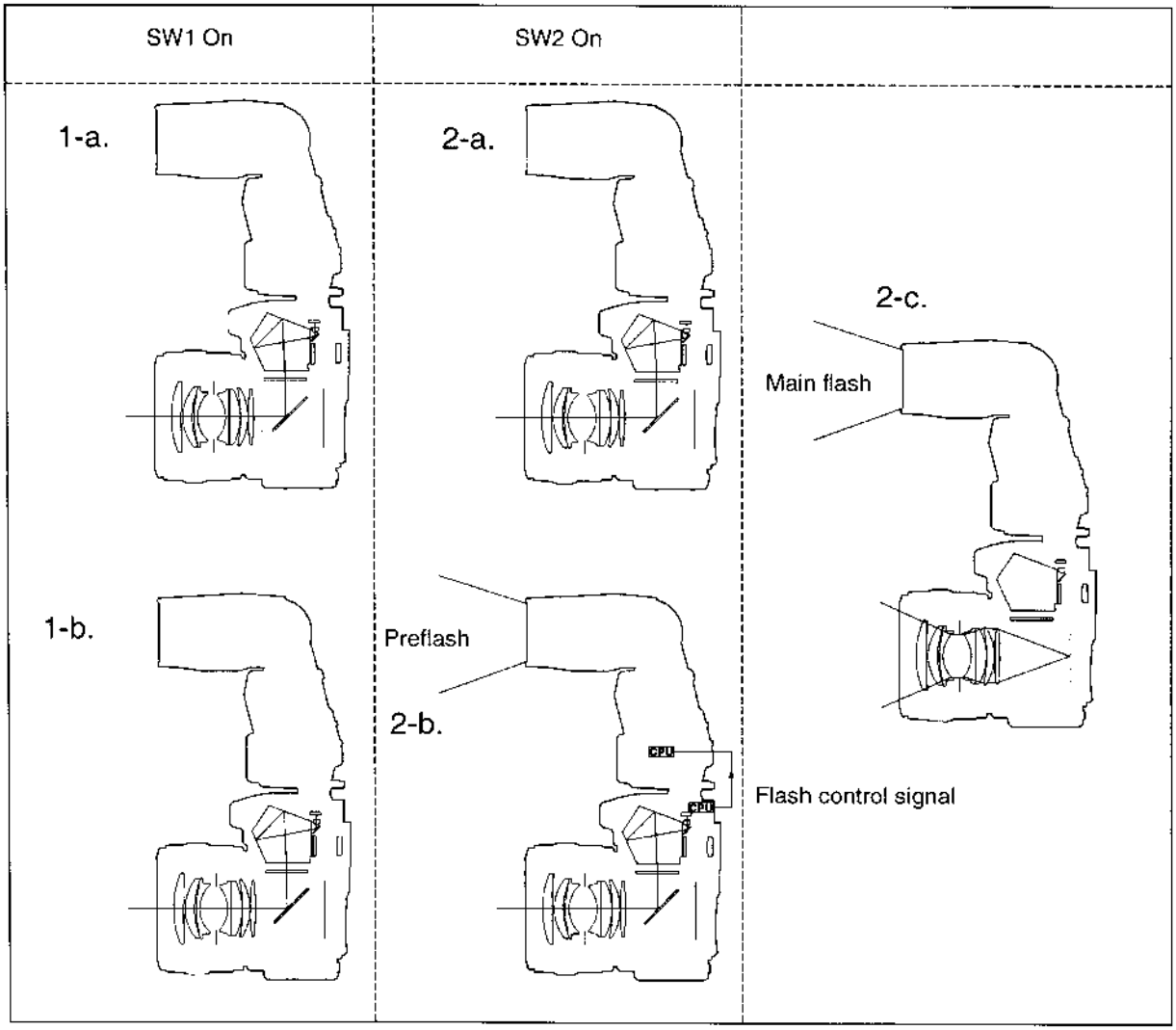


Fig. 2-16 E-TTL Autoflash System

2) Photography with E-TTL Auto Flash Exposure System

Flash exposure control for previous EOS cameras was designed with two objectives in mind: to supply light in low-light situations and to provide fill-in flash for backlit subjects. In other words, the flash was basically designed for use when ambient light alone was insufficient. Therefore, when flash was used in an AE mode which set the correct exposure for frontal light conditions, overexposure was likely. However, many photographers like to use medium-strength flash with frontal lighting.

The algorithm used by the E-TTL Auto Flash Exposure System is a major feature. It allows the flash to adapt to various lighting conditions with the 6-zone metering sensor which meters ambient light and the preflash. Mixed light readings are used to obtain a natural balance between ambient light and flash.

3) Camera and Speedlite Operation Steps

This shows the E-TTL Exposure System operation steps executed by the EOS 50/55/Elan II and Speedlite 380 EX.

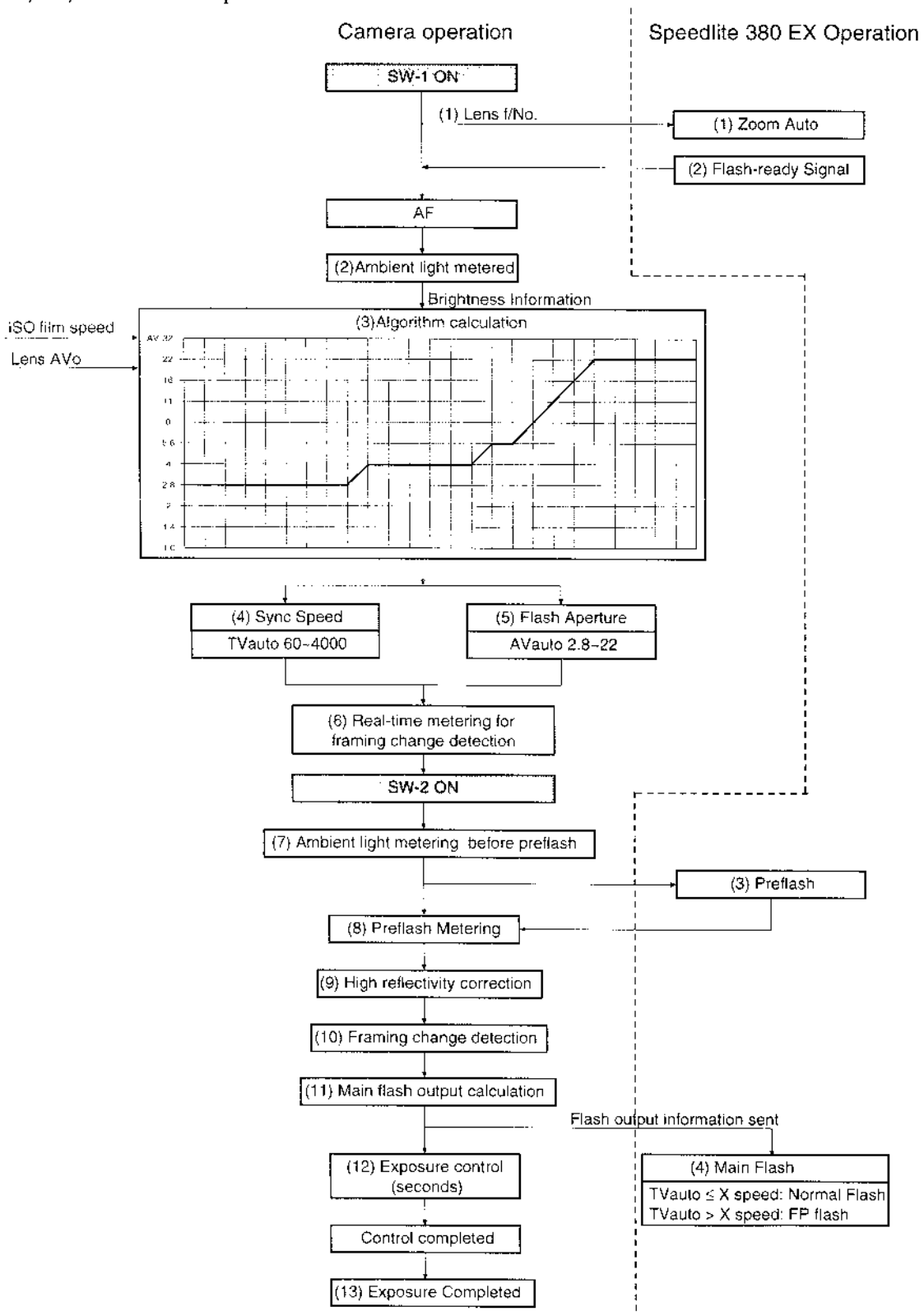


Fig. 2-17 E-TTL Autoflash Operation

- Operation steps executed by the 380 EX:

  1) The flash coverage is set automatically. (The lens focal length is relayed from the camera to the 380 EX.)
  2) The flash-ready signal is sent to the camera.
  3) The preflash is fired.
  4) The main flash is fired. (The camera sends the main flash output information to the 380 EX.)

     With the EOS 50/55/Elan II set to a Creative Zone mode and the 380 EX's FP flash switch turned on, high-speed sync (FP flash) is set when the shutter speed is faster than the X-sync speed.

     With the 380 EX's FP flash switch turned on and the shutter speed set slower than the X-sync speed, normal flash is set.

     When the EOS 50/55/Elan II is set to a Programmed Image Control mode or when the 380 EX's FP flash switch is turned off, normal flash is set.

- Operation steps executed by the EOS 50/55/Elan II:

  1) Lens focal length information is sent to the 380 EX.
  2) The ambient light is metered with the current metering mode.
  3) The algorithm calculates the exposure control.
  4) The flash aperture is set.
  5) Sync speed

     The flash aperture and sync speed calculated by the algorithm are set by the EOS 50/55/Elan II's exposure mode and metering mode. See Tables 2-9 and 2-10.

Table 2-9 Sync Speed

EOS 50/55/Elan II Exposure Mode	Sync Speed
Programmed Image Control	The sync speed is set automatically from 1/60 to 1/125 sec. by the EOS 50/55/Elan II's E-TTL program.
Program AE (P)	The sync speed is set automatically from 1/60 to 1/125 sec. by the EOS 50/55/Elan II's E-TTL program. When the 380 EX's FP flash switch is on and the scene is too bright for the smallest aperture to compensate, FP flash control is set automatically to enable all shutter speeds (1/60 to 1/4000 sec.) to synchronize with the flash.
Shutter-priority AE (Tv)	The shutter speed set manually becomes the sync speed. (30 to 1.125 sec.)
Aperture-priority AE (Av)	The shutter speed set automatically by aperture-priority AE becomes the sync speed. (30 to 1/125 sec.)
Manual (M)	The shutter speed set manually becomes the sync speed. (30 to 1.125 sec.)
Depth-of-field AE (DEP)	Same as with Program AE (P).

* In the Tv, Av or M mode when the 380 EX's FP flash switch is on, the flash can synchronize with bulb (M mode) and all shutter speeds (30 to 1/4000 sec.). FP flash takes effect if the sync speed is faster than 1/125 sec.

Table 2-10 Flash Aperture

EOS 50/55/Elan II Exposure Mode	Flash Aperture
Programmed Image Control	The flash aperture is set automatically by the EOS 50/55/Elan II's E-TTL program.
Program AE (P)	The flash aperture is set automatically by the EOS 50/55/Elan II's E-TTL program.
Shutter-priority AE (Tv)	The aperture set automatically by Shutter-priority AE becomes the flash aperture.
Aperture-priority AE (Av)	The aperture set manually becomes the flash aperture.
Manual (M)	The aperture set manually becomes the flash aperture.
Depth-of-field AE (DEP)	Same as with Program AE (P).

6) Real-time metering for framing change detection
To detect any changes in framing while the shutter button is being pressed halfway, real-time metering is executed. After ambient light is metered in step 2), real-time metering continues up to the moment the shutter button is pressed completely. The E-TTL Auto Flash Exposure System obtains a correct exposure with a mixture of ambient light and flash. Real-time metering is necessary so that the algorithm can take the ambient light into account when calculating the correct exposure. See 11). Framing change detection is described in 10).

SW1

7) Instantaneous metering of ambient light before preflash.

8) Preflash metering
The light reflected off the subject by the preflash is calculated by subtracting the ambient light reading taken before the preflash (7) from the subject brightness metered during the preflash (8). The metering for 7) and 8) are executed instantaneously (1 ms) to prevent flicker from affecting the result.

SW2

9) Correction for highly reflective subjects
Correction is executed for highly reflective subjects such as glass. If the S0, S1, or S2 sensor attached to the current focusing point senses an abnormally strong light reflection, the sensor controls the flash to prevent underexposure of the subject.

10) Framing change detection
EOS cameras equipped with multiple focusing points have had the focusing point linked to the flash exposure through multiple-zone flash metering. However, if the framing is changed after focus is achieved in the One-Shot AF mode, the focusing point may no longer cover the subject. In such a case, the correct flash exposure may not be obtained. To resolve this potential problem, the E-TTL system compares the ambient light reading obtained during the halfway pressing of the shutter button (step 2) and the real-time reading obtained immediately before the shutter button is pressed completely (step 6). If the brightness distribution of the two readings differs beyond a stipulated degree, the camera deems that the framing has been changed. The flash exposure linkage to the original focusing point is then canceled, and the correct flash exposure is based on one of the 6-zone metering sensor's five sensors (S1, S2, S3, S4, S5) that senses the greatest reflected light (whose distance is deemed to be shortest). The flash is consequently controlled to obtain the correct exposure. Any change in the framing can be detected only in the One-Shot AF mode (or AI Focus mode set to One-Shot AF). If the shutter button is pressed completely without being pressed halfway first, the camera will deem that there has been no change in the framing.

11) Calculation of main flash output
The E-TTL system's algorithm calculates the main flash output according to n-times the preflash output. The result is sent to the 380 EX.

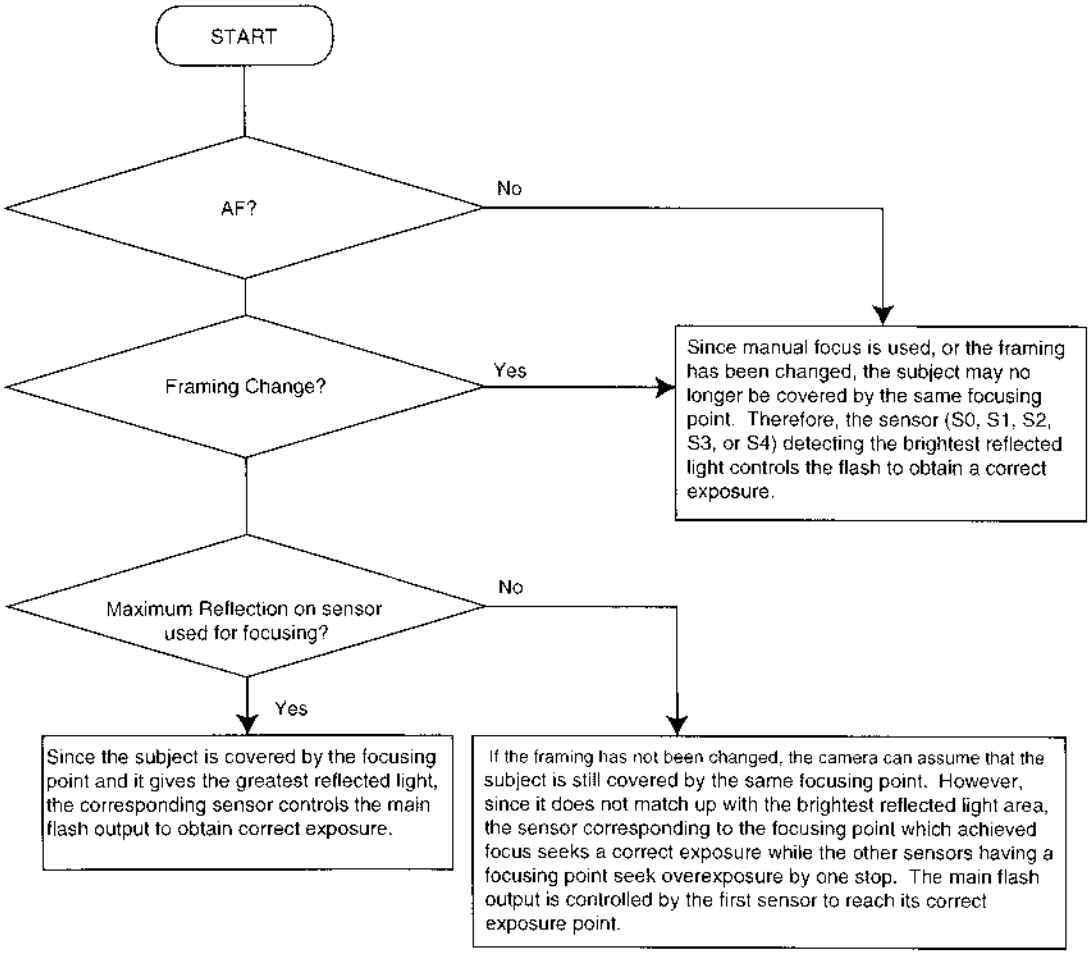

START
AF?
No
Framing Change?
Yes
Since manual focus is used, or the framing has been changed, the subject may no longer be covered by the same focusing point. Therefore, the sensor (S0, S1, S2, S3, or S4) detecting the brightest reflected light controls the flash to obtain a correct exposure.
Maximum Reflection on sensor used for focusing?
No
Yes
Since the subject is covered by the focusing point and it gives the greatest reflected light, the corresponding sensor controls the main flash output to obtain correct exposure.
If the framing has not been changed, the camera can assume that the subject is still covered by the same focusing point. However, since it does not match up with the brightest reflected light area, the sensor corresponding to the focusing point which achieved focus seeks a correct exposure while the other sensors having a focusing point seek overexposure by one stop. The main flash output is controlled by the first sensor to reach its correct exposure point.

Fig. 2-18 E-TTL Autoflash Algorithm Diagram

12) Exposure control.

13) Operation completion.

4) FE Lock

FE lock is AE lock for flash. The operation steps executed by the EOS 50/55/Elan II are described below.

* The operation steps executed by the 380 EX are as described previously.

FE lock (1) sequence: Shutter button pressed halfway, pause, FE lock, and shutter button pressed completely.

■ Major operation steps executed by the EOS 50/55/Elan II:

1) Ambient light metered by the camera's metering mode.
2) Exposure control calculated by the algorithm.

* The flash aperture and sync speed are set as described previously.

3) Real-time metering for framing change detection.
The purpose is as described previously. In this case, real-time metering continues until the FE lock button is pressed.

4) When the FE lock button is pressed, "FEL" is displayed for 0.5 sec. in the viewfinder. The focusing point for the FE lock also flashes in red.

5) Ambient light metered instantaneously immediately before the preflash.
Normally, the center focusing point sensor (S0) meters the ambient light. If the focusing point is dial-selected or eye-selected with Custom Function No. 8 set to 1, the selected focusing point corresponding sensor (S0, S1, or S2) meters the ambient light.

6) Preflash metering
The preflash reflected off the subject is metered by the same sensor used in step 5).

7) Calculation and locking of the main flash output.
While the FE lock button is on (up to 16 sec. after it is released), the flash exposure value that has been calculated is locked.
During this time, the Quick Control Dial can be used for background exposure compensation. Although the aperture setting will differ depending on the exposure mode (P, Tv, M, or DEP), the camera controls the flash output accordingly in accordance with the locked flash exposure value. Correct flash exposure of the subject is thereby obtained regardless.
Also, if the available flash output is deficient by 0.5 or more stops for obtaining correct flash exposure, the lightning bolt symbol blinks (2 Hz) as an insufficient-flash warning.

8) When the shutter button is pressed completely, the exposure sequence takes place and the photo is taken.

FE lock (2) sequence: FE lock, shutter button pressed halfway, and shutter button pressed completely.

■ Major operation steps executed by the EOS 50/55/Elan II:

1) Real-time metering for framing change detection.
Real-time metering is executed immediately when the FE lock button is pressed to calculate the main flash output.

2) "FEL" is displayed for 0.5 sec. in the viewfinder. The focusing point for the FE lock also flashes in red.

3) Ambient light metered instantaneously immediately before the preflash.
Normally, the center focusing point sensor (S0) meters the ambient light. If the focusing point is dial-selected or eye-selected with Custom Function No. 8 set to 1, the selected focusing point corresponding sensor (S0, S1, or S2) meters the ambient light. If Eye-Controlled Autofocus is being used, the sensor (S0) for the center focusing point meters the ambient light since no focusing point has been eye-selected at this point.

4) Preflash metering
The sensor used in step 3) is used to meter the preflash reflected off the subject.

5) Calculation and locking of the main flash output.
While the FE lock button is on (up to 16 sec. after it is released), the flash exposure value that has been calculated is locked.

6) The EOS 50/55/Elan II meters the scene in real time according to the current metering mode.

While the FE lock button is on, the Main Dial can be used. Even if the aperture setting is changed, the flash exposure value remains locked. Therefore, the flash output is adjusted accordingly to obtain the correct flash exposure of the subject.

7) When the shutter button is pressed halfway, ambient light is metered by the current metering mode.

8) Exposure control calculated by the algorithm.
   * The flash aperture and sync speed are set as described previously.

9) When the shutter button is pressed completely, the exposure sequence takes place and the photo is taken.

5) FP Flash (High-speed sync)

As described earlier, FP flash is enabled when the EOS 50/55/Elan II is set to a Creative Zone mode and the 380 EX's FP flash switch is on. FP flash (high-speed sync) enables the camera to synchronize with the flash at all shutter speeds. FP flash restricts the flash output to a stipulated level. By having a fixed-output flash fire over a continuous period of time, flash control is possible even at high shutter speeds when the shutter curtains do not open completely. Table 2-9 shows how the shutter speed synchronizes. The sync speed can be set automatically (in the P, Av, or DEP mode) or manually (in the Tv or M mode).

Figure 2-19 shows how the flash fires in the FP flash mode and normal flash mode. In either case, the main flash is calculated and locked according to n-times the output of the preflash. Therefore, even if exposure compensation is set while the FE lock button is on and the sync speed becomes equal to or slower than the X-sync speed, the flash mode changes automatically.

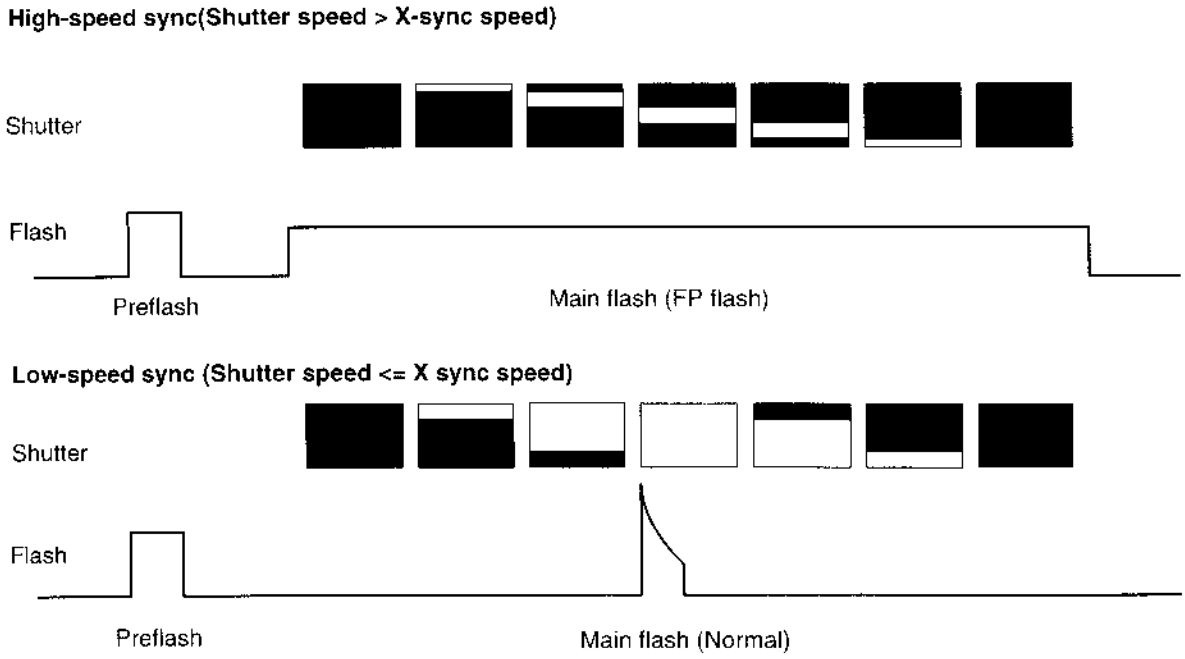


Fig. 2-19 FP Flash Diagram

2. CIRCUIT EXPLANATIONS

2.1 Overall Operation

1) Shutter Release Button

The shutter button has two detents. At the first, (SW1), autofocusing (including Eye-Controlled Autofocusing) and metering are activated. At the second, (SW2), the shutter is released.

Like the EOS 5/A2E, the shutter release time lag is constant to stabilize the mirror reflex time. The time period from when the motor is turned on to when the front-curtain magnet releases is fixed at 80 ms.

2) Operation Sequence

Figure 2-20 shows the timing chart. Figures 2-21 and 2-22 show the overall operation and sequence flow for One-shot AF and AI Servo AF.

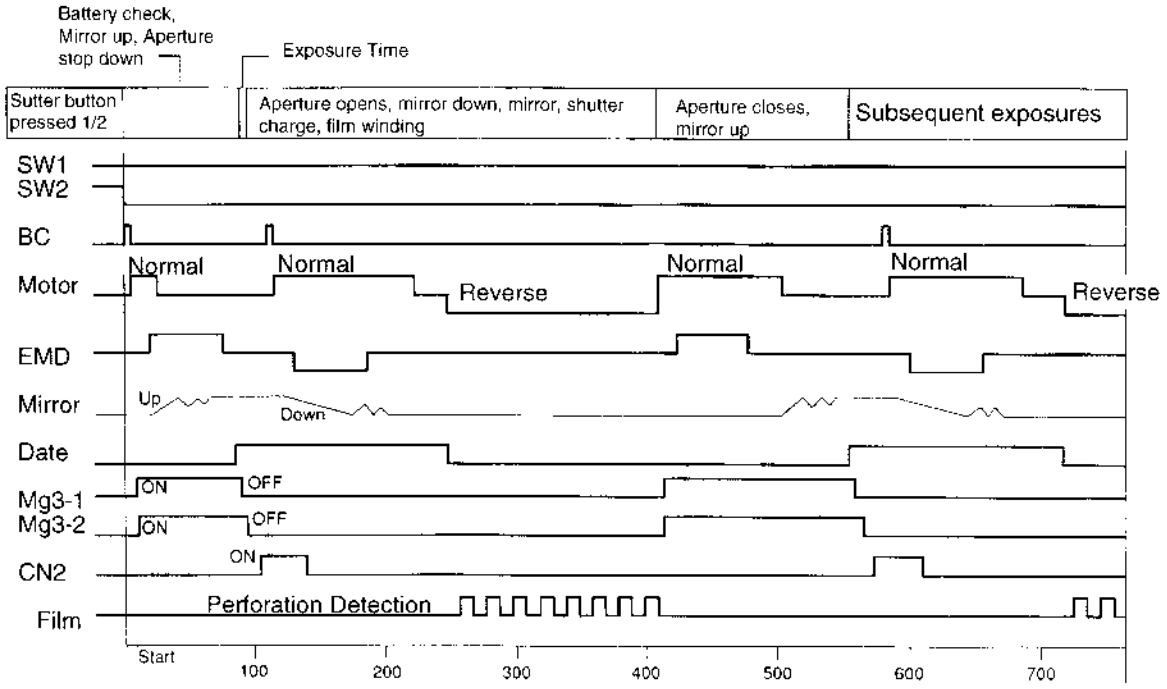


Fig. 2-20 Overall Timing Chart

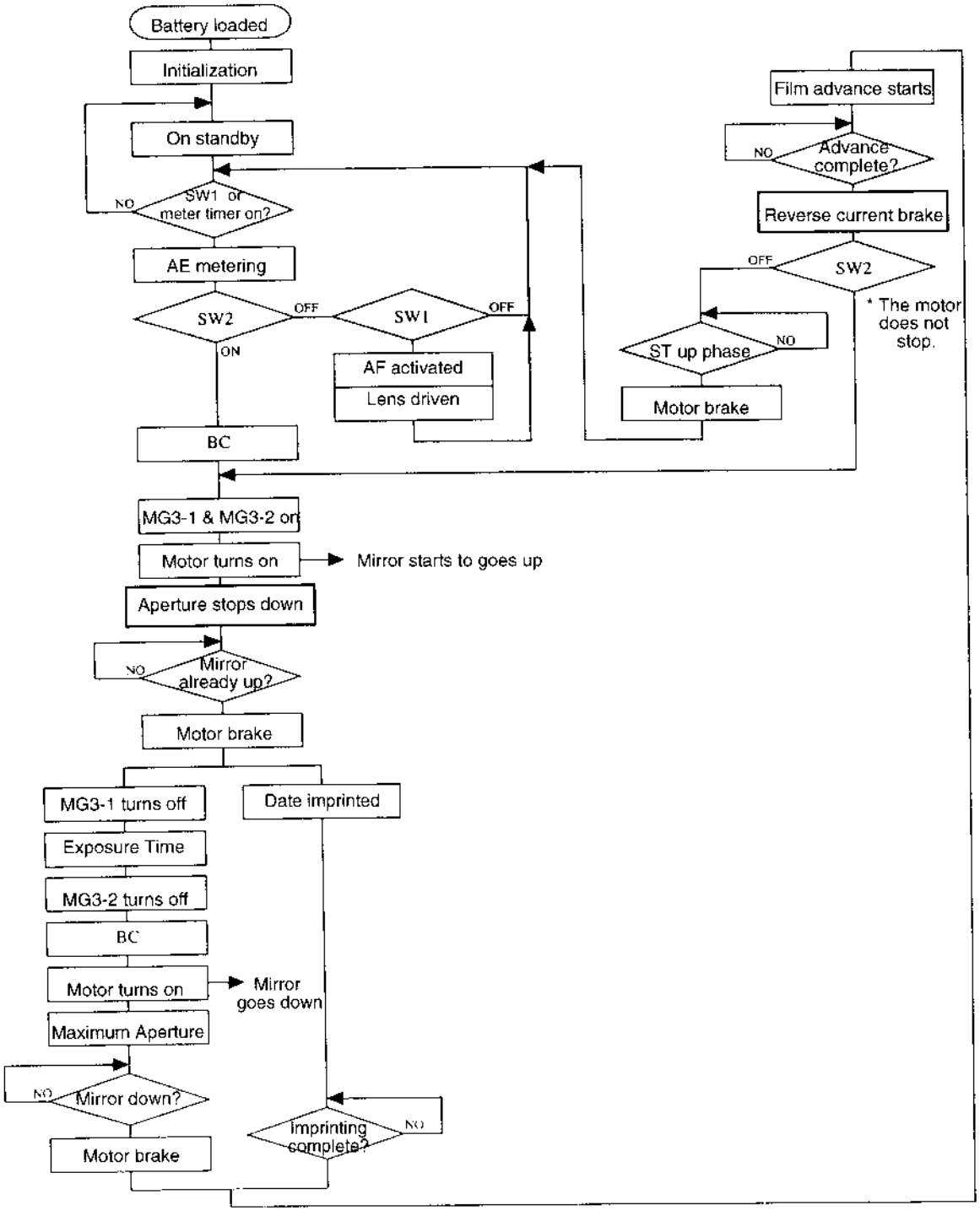


Fig. 2-21 Sequence Flow (One-Shot AF)

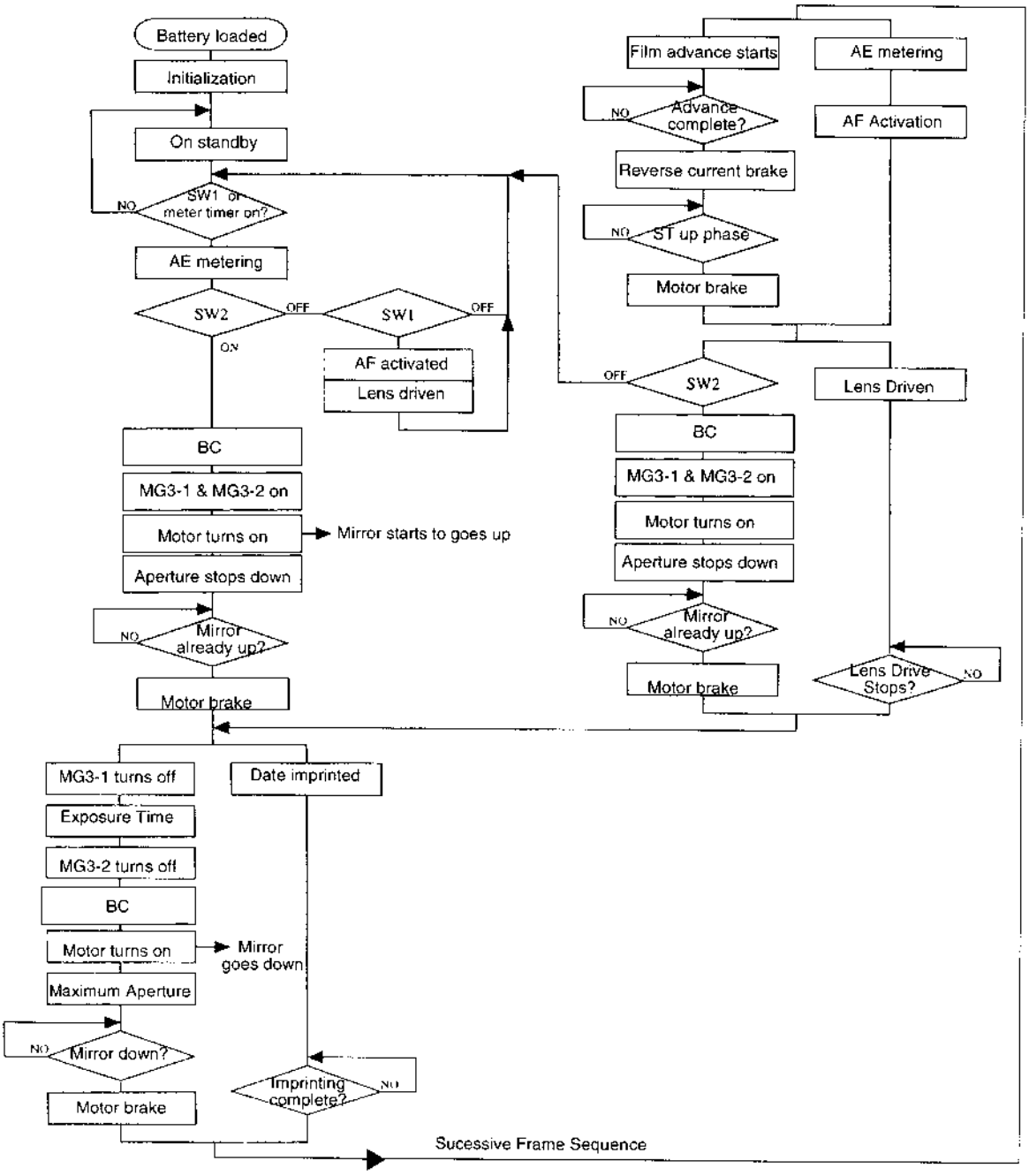


Fig. 2-22 Sequence Flow (AI Servo AF)

2.2 Electronic Circuitry and Power Source

1) Overview

The EOS 828's electronic circuitry centers on the main CPU and consists of 14 LSIs and ICs, quartz oscillators, display elements, and other components.

Except for the exposure metering and some interface functions, most operations are digital. AF calculations and camera sequencing are controlled by a rapid 16MHz clock.

Table 2-11 Components	
LSI, IC	14
Motors	1
Magnets	2
Displays	2
Emmiters	19
Sensors	5

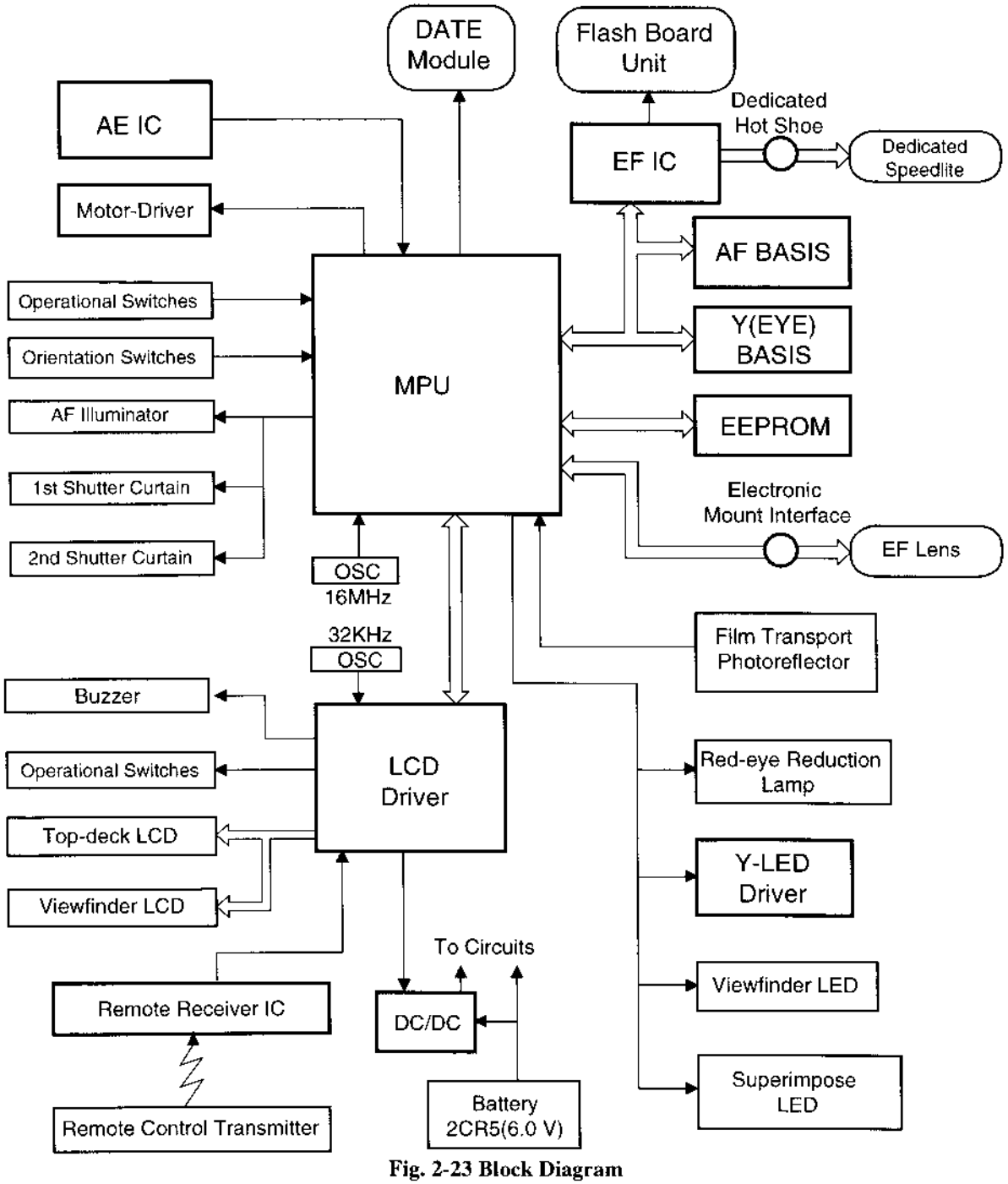


Fig. 2-23 Block Diagram

2) Main CPU and Major LSIs and ICs

The main CPU is 1.8 times faster than the EOS 5 / A2E's and the ROM is also 1.33 larger. It is the newest high-speed super microcomputer which processes large amounts of information at high speed for horizontal and vertical Eye-Controlled Autofocus (using an area BASIS), AF calculation at the active focusing point, and AE control with the 6-zone metering sensor.

1. MPU (Main-CPU)
   Receives various information entered with the Main Dial, Quick Control Dial, etc. Controls the camera's overall sequence to calculate or control Eye-Controlled Autofocus, autofocusing, AE, the motor and the LCD panel through the LCD driver.
2. LCD DR (LCD driver)
   Same as the EOS A2E's. In constant operation to drive the LCD panel and the LCD in the viewfinder. Also controls the operation switches and beeper.
3. AE IC (Exposure Metering sensor)
   Same as the EOS 500/Rebel X's. Packaged in clear mold, it is a Canon-manufactured LSI integrated with a highly sensitive 6-zone SPC amplifier for evaluative, partial, and E-TTL evaluative autoflash metering.
4. EF IC (TTL Flash metering sensor)
   Same as the EOS 500/Rebel X's. Four-zone, three-point flash metering sensor linked to the three focusing points. Packaged in clear mold, it is a Canon-manufactured LSI which controls the built-in flash, serves as an I/O communications link for external flash units, and controls flash output.
5. BASIS (Focusing sensor)
   Same as the EOS 500/Rebel X's. High-precision multi-BASIS with three focusing points including a cross-type center focusing point. Packaged in clear mold, it is a Canon-manufactured LSI.
6. Y-BASIS (Eye-control AF sensor)
   Eye-Controlled Autofocus Area BASIS with 7,000 pixels. Suited for Eye-Controlled Autofocus, it eliminates stray light and reads at high speed. Packaged in a clear case, it is a Canon-manufactured LSI with various functions.
7. EEPROM
   Same as the EOS A2E's. With a capacity of 2 kilobytes, it stores various adjustment data and the frame count.
8. MD-1, MD-2 (Motor drivers)
   Same as the EOS 500/Rebel X's. Motor-controlling IC. For improved control of the coreless motor, two drivers are used in series to drive the motor.
9. REM IC (Remote control receiver IC)
   Same as the EOS Elan's. Receives optical signals from the infrared remote control transmitter dedicated to EOS cameras.
10. Y-LED IC (Eye-control AF IRED driver)
    To enable horizontal and vertical Eye-Controlled autofocus, this IC selectively drives the eight IREDs.
11. DC/DC (DC/DC control IC)
    Dedicated control IC to produce a DC/DC circuit which saves space, power, and money.

3) Battery Level

Automatic battery check and the camera's retention of settings when power is out function the same way as the EOS 50 / A2E). Table 2-12 shows the battery levels.

Even when the battery check shows , you can still release the shutter and get a proper exposure. However, before executing a power-consuming operation such as autoloading, shutter release, film advance and rewind, the camera displays the battery level automatically. If the battery level is insufficient, the camera stops operating.

During bulb exposure, power is supplied only to the second curtain's electromagnet to conserve power. With a new battery, continuous bulb exposure of up to about fifteen hours is possible. This compares to only about six hours for the EOS 50 / A2E.

Table 2-12 Battery Condition Indicators

	Voltage	Battery Mark	Meaning
1	5.44V up		Fully operational - no problem
2	4.64 to 5.44V		Operational, but have a new battery ready
3	4.04 to 4.64V		It's time to change.
4	Under 4.04V		Change the battery! Shutter Inhibit possible.

2.3 Power Distribution

1) Clock

The clock for most IC functions are generated by two separate oscillators.

MPU:	16MHz (FAR)	Generated when DC/DC Conv. turns on.
LCD Drivers:	32.768KHz (quartz)	Always on if power available.

2) Power Distribution

1. VBAT — Battery (2CR5) Voltage: Used by shutter lamps (Red-eye reduction, AF Illuminator) Finder LED, SI-LED, Eye-control IREDs and Panorama LED.
2. VDD — About 4.7V: Main power for MPU, LCD-Driver.
3. E1 — About 5.0V DC/DC Convertor output for digital circuits: EEPROM, EF-IC, Motor-Drivers, YLED-Driver, etc. Return path is DGND.
4. E2 — About 5.0V DC/DC Convertor output for analog circuits: Exposure (AE and flash), Ranging, and Eye-control.Return path is AGND.
5. VPP — About 15V: IGBT-Driver power, generated by Motor-Driver Charge Pump.
6. VBAT2 — Lens actuator power, generated by switching VBAT through TMOS.
7. VDD2 — Lens Circuit power, VDD after it passes through the MIF Switch.

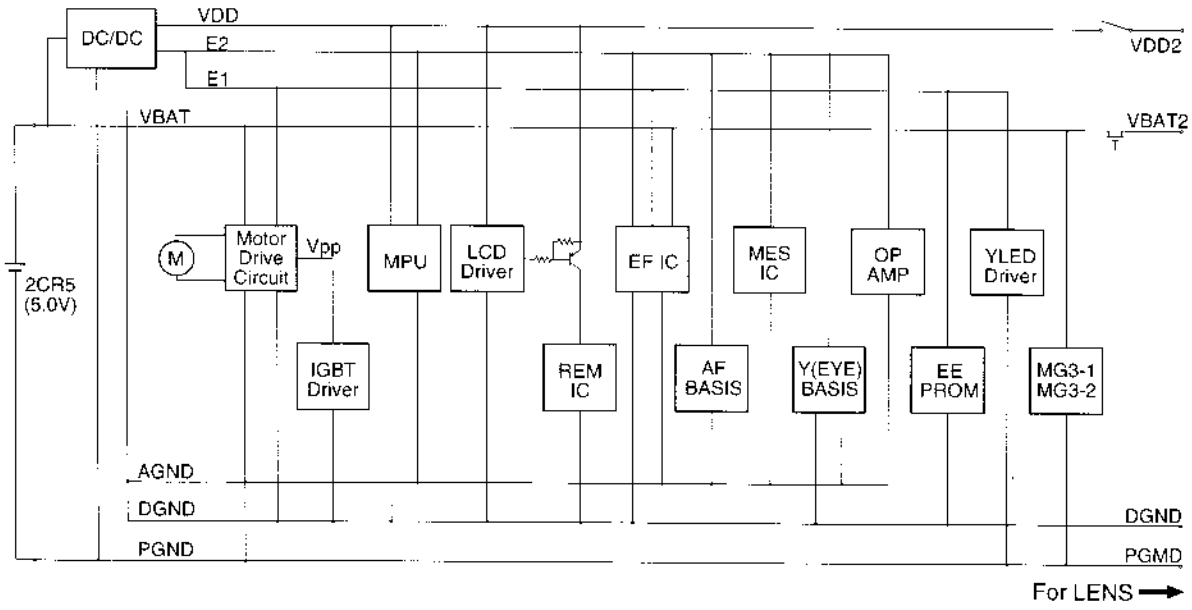


Fig. 2-24 Power Distribution

2.4 Battery Installation

1) MPU Initial Sequence

1. When the battery is installed, VBAT is applied to the DC/DC Convertor, which generates VDD (4.7V) and applies it to the LCD-DR and MPU. Also, when the battery is installed, it opens the RESET switch applying the 32.768KHz clock to the LCD-DR.
2. Simultaneously, the /E1ON pin of the LCD-DR goes low, turning on the DC/DC.
3. When the DC/DC's E1 exceeds 4.5V, the EF-IC's /RES2 goes high. When the LCD-DR see this change on /RESIO, the LCD-DR switches /RESMPU to high.
4. This resets the MPU and the 16MHz clock is generated.
5. Approximately 8ms after the 16MHz clock starts, the MPU is operational.

2) Switch Input Sequence

1. When it senses a switch change, LCD-DR sends /LCDREQ low.
2. Simultaneously, the /E1ON pin of the LCD-DR goes low, turning on the DC/DC.
3. When the DC/DC's E1 exceeds 4.5V, the EF-IC's /RES2 goes high. When the LCD-DR see this change on /RESIO, the LCD-DR switches /RESMPU to high.
4. This resets the MPU and the 16MHz clock is generated.
5. Approximately 2ms after the 16MHz clock starts, the MPU is operational.

3) Low Battery Sequence

1. EFIC always monitors E1. During operation or at start-up of DC/Dc, if E1 is below 4.2V, EFIC not only resets, but also sends /RES2 low.
2. When the LCD-DR see this change on /RESIO, it switches /E1ON to high and /RESMPU to low. This turns the DC/DC and it remains off until another switch input is received.
3. When the MPU sees /RESMPU go low, it senses operations and goes into standby mode.

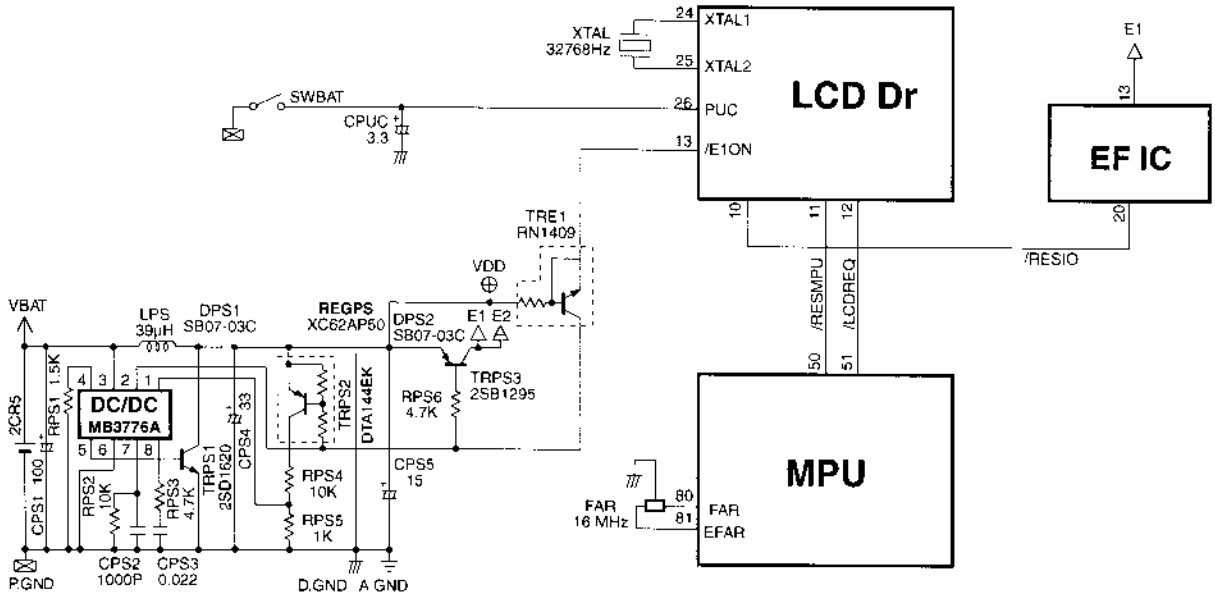


Fig. 2-25 Battery Installation

2.5 Battery Check

The battery check does not use a separate load. Instead motor current is applied in the normal and reverse directions.

The battery is checked when the battery is installed, when the dial is moved from the Lock position, and when the shutter is released.

1. The MPU communicates with the EFIC and selects the $^{VBAT}/_{2}$ output from EFAD.
2. Motor current is applied in the normal and reverse directions. The current is digitalized through the A/D convertor and the average established.
3. The result is compared to the inhibit voltage and if it below the inhibit level, the battery mark flashes.

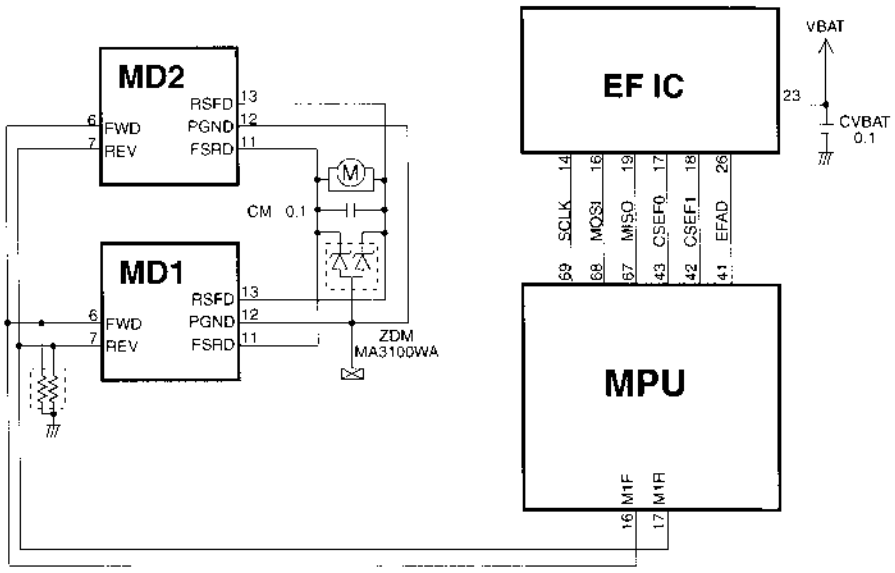


Fig. 2-26 Battery Check

2.6 Autoloading

1. When film is installed and the back cover closed, the LCD-DR feels the change in the BPSW (back cover switch) and fires up the DC/DC convertor.
2. The MPU communicates with the LCD-Dr and reads the switch inputs to determine which switch changed states.
3. When it finds that BPSW has changed and is now closed, it checks the state of the cartridge switch PTIN-SW, and if a cartridge is installed, the autoloading sequence is initiated.
4. The battery is checked.
5. A pause of 100ms allows the cartridge to stabilize.
6. The DX code is read.
7. The MPU controls the motor drivers MD1 and MD2 through the M1F and M1R lines to drive the motor in the normal direction. This switches the motor to the film winding phase.
8. The motor is then reversed to start the actual film winding.
9. The film sensor's photoreflector (PR-FILM) data PRAD is A/D converted (edge reading) to count the perforations transported, and determine the comparator level for use during winding.
10. After approximately 3.5 frames are wound, the motor is stopped and a "1" is displayed on the LCD.
11. The motor turns forward to return to the flash ready position. (This is the initial, or home, position for all operations.

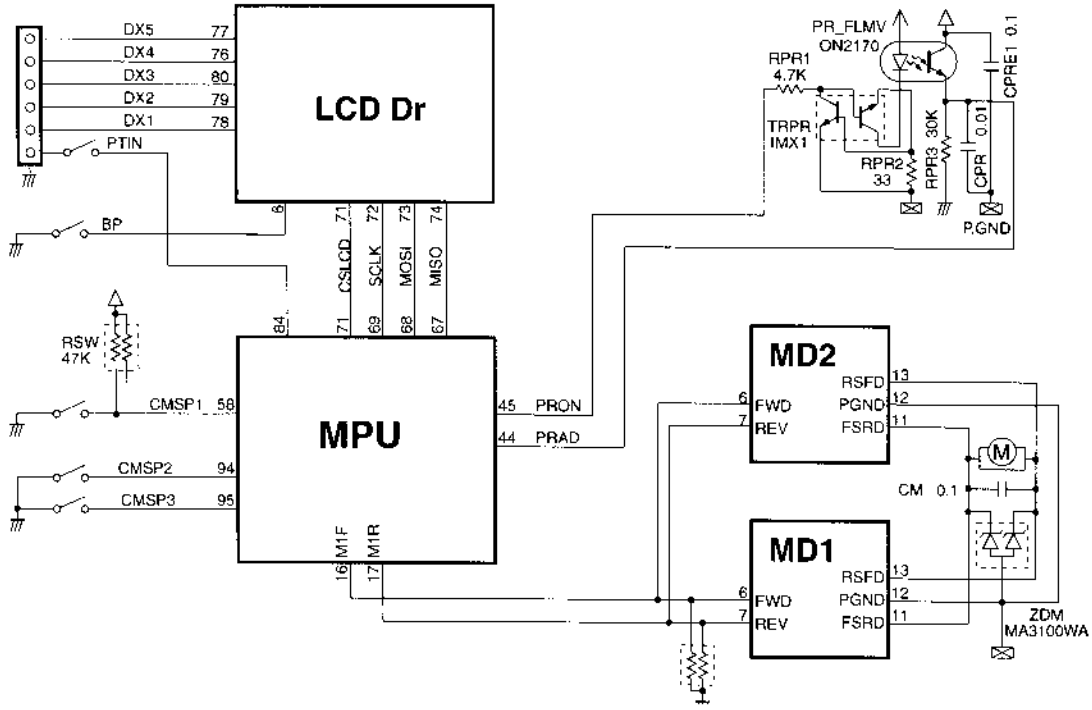


Fig. 2-27 Film Transport

2.7 Light Metering

1. When SW1 is turned on the MPU starts the exposure metering sequence.
2. The MPU sets the metering areas through D0 ~ D2 and the sensor output is applied to the A/D convertor through the AEAD line.
3. The MPU reads the compensation data from the EEPROM applies it to the data an determines the exposure value.
4. The MPU checks the camera mode setting and determines the aperture and/or shutter speeds and communicates this data to the LCD-DR.
5. The LCD-DR displays the data on the LCD.

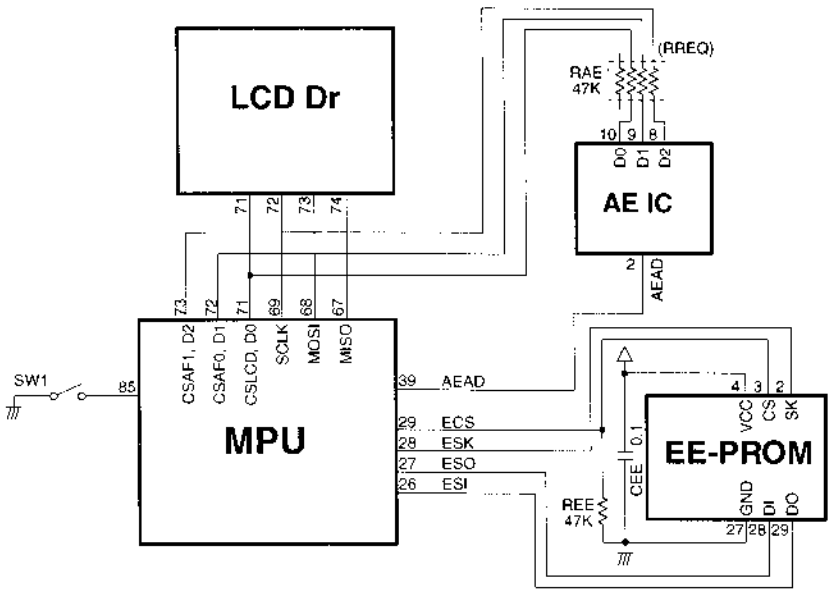


Fig. 2-28 Light Metering

2.8 Autofocus Ranging

1. When the MPU senses that SW1 is on and that ranging may start, the following sequence determines the distance to the main subject.
2. Focusing Point Determination

   2.1 Communication with Lens: Through LCLK and DLC, the MPU receives the necessary lens information.

   2.2 BASIS Data Accumulation

   a. The BASIS reference clock, BCLK, of 500KHz is output.
   b. The D/A output signals (DA1, DA2) are set.
   c. The BASIS logic is reset by the CLK0, CLK1, CLK2, and READ signals.
   d. The order to prepare for data accumulation is sent to the BASIS by CSAF0, CSAF1, SCLK, and MOSI signals.
   e. The order for data accumulation on four lines is sent to the BASIS by the CLK0, CLK1, CLK2, and READ signals.
   f. When each lines has reach the threshold point, the BASIS switches /TINTE from high to low.
   g. The BASIS then informs the MPU through CSAF0, CSAF1 that the line has finished the data accumulation.
   h. The CLK0, CLK1, CLK2, and READ signals the image data for the line, A/D convert it and store it in the RAM.
   i. Compensation data is read through the ECS, ESK, ESO, and ESI lines and the image date is corrected.

   2.3 The RAM data is read and the prediction calculations are made for each line (image displacement) .

   2.4 The prediction calculations are converted to defocus and the lens' best focus compensation added at this point.
3. If focus is not achieved, the lens movement is read and the focus is recalculated.
4. If focus is achieved, the active focus sensor information is sent over SPLED1, SPLED2, and SPLED3 to light the superimposed focus point LED.
   *: If the subject is dark, the AF Illuminator is used.

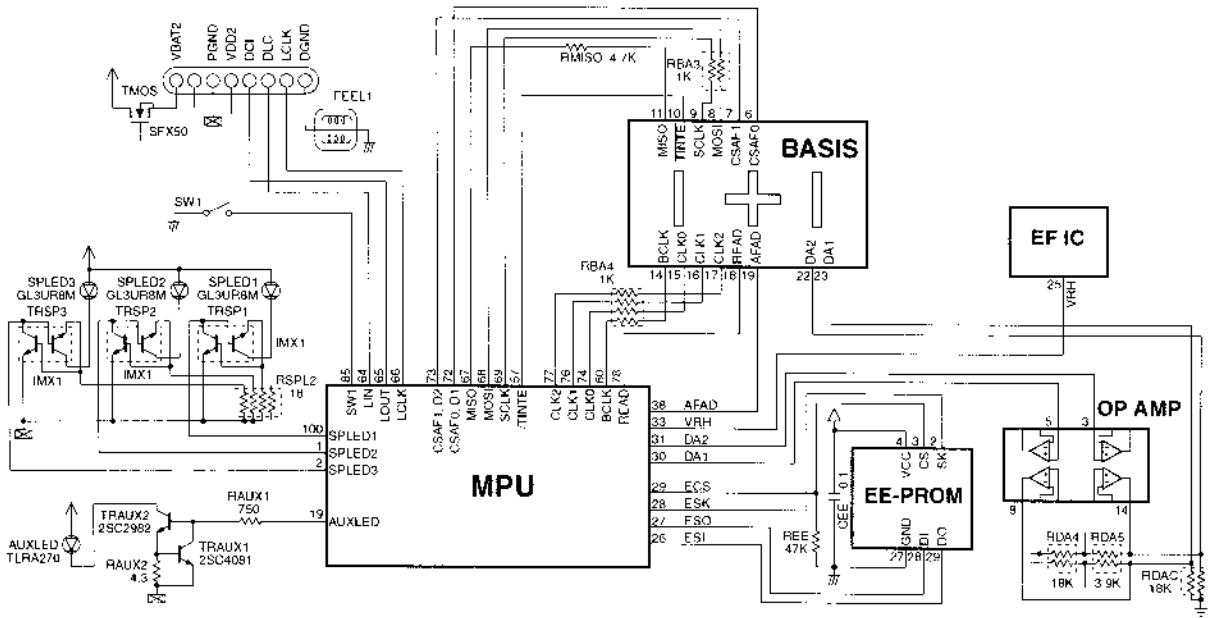


Fig. 2-29 Autofocus Ranging

2.9 Shutter Release

1. When SW2 on information is received by the MPU, it interupts and initiates the following release sequence.
2. The viewfinder LCD (ILC) is turned off by fixing the PWM output at the low level.
3. An "all stop" order is sent to the lens.
4. The battery is checked.
5. The motor is driven forward, starting the mirror up.
6. The shutter magnet is energized.
7. When the motor reaches the mirror up position on the phase board, the motor stops.
8. The diaphragm stop down signal is sent to the lens.
9. When the proper aperture is reached the diaphragm stop signal is sent.
10. Date printing starts.
11. Mg3-1 is turned off and the first curtain runs.
12. After the exposure time expires, Mg3-2 is turned off and the second curtain runs. (CN2 SW goes on, also.)
13. The battery is checked.
14. To bring the mirror down, the motor is energized.
15. When the mirror is down and the shutter is recharged, the motor stops with the phase board at Wind phase, or at Flash phase without film or during multiple exposure.
16. The motor is deenergized.

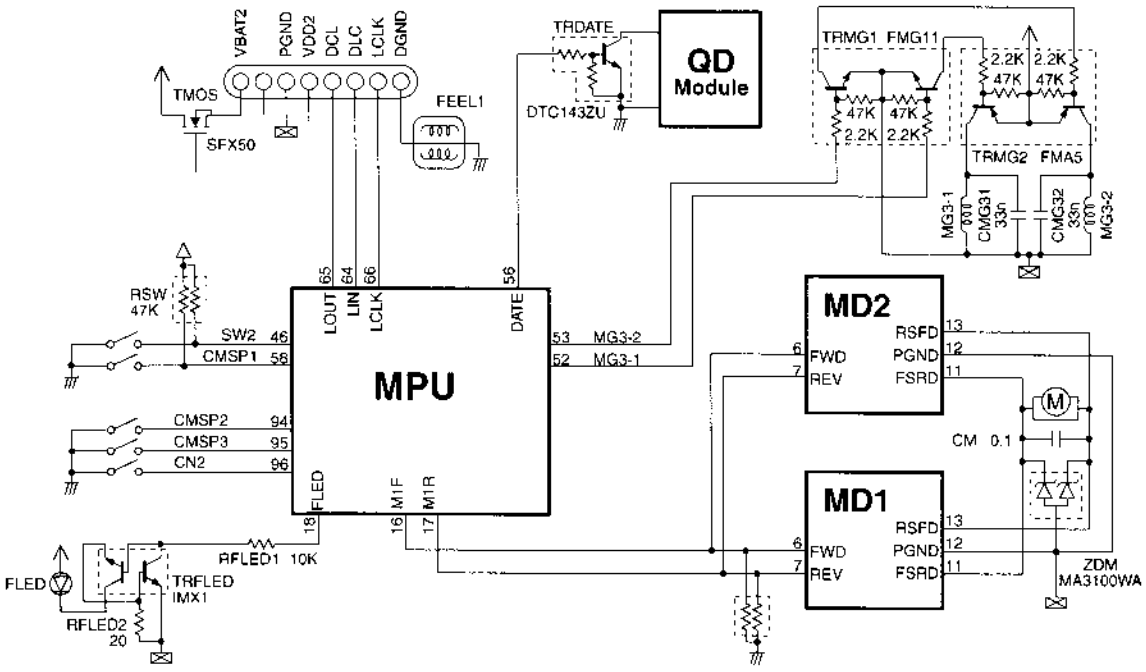


Fig. 2-30 Shutter Release

2.10 Built-in Flash

1) Charge Sequence

1. The EFIC receives the order to start charging from the MPU, it puts a high on the OSC line. This starts the Schmitt trigger circuit producing the high voltage.
2. The EFIC monitors the main capacitor voltage through a voltage divider network on the SENSE line. When charge ready voltage is reached, it informs the MPU.
3. The MPU informs the LCD-DR to light the flash mark on the LCD.
4. When the full charge voltage is reached, the EFIC sends the OSC signal low stopping the charge.
5. The EFIC informs the MPU and the MPU terminates the charge sequence.

2) Flash Firing and Termination Sequence

1. The MPU outputs film speed (ISO) data to OPAMP1 on DA1 and DA2.
2. The data is converted in OPAMP1and sent to the EFIC on DAC1 and DAC2.
3. The X sync on signal from the shutter is input to EFIC on the SYNC line and output as a low on SPCR.
4. SPCR is input to MD2 on /TIN and output on TOUT to control the VPP level of IGBT-DR.
5. IGBT-DR amplifies this and outputs it to trigger the IGBT in the built-in flash with a high.
6. When the IGBT-DR is triggered, the flash fires.
7. EFIC monitors and integrates the flash output. When it reaches the predetermined level input by DAC, it terminates the flash.
8. The process is the reverse of the trigger process and involves the Motor-Driver IC, IGBT-DR and IGBT going low and stopping the flash.

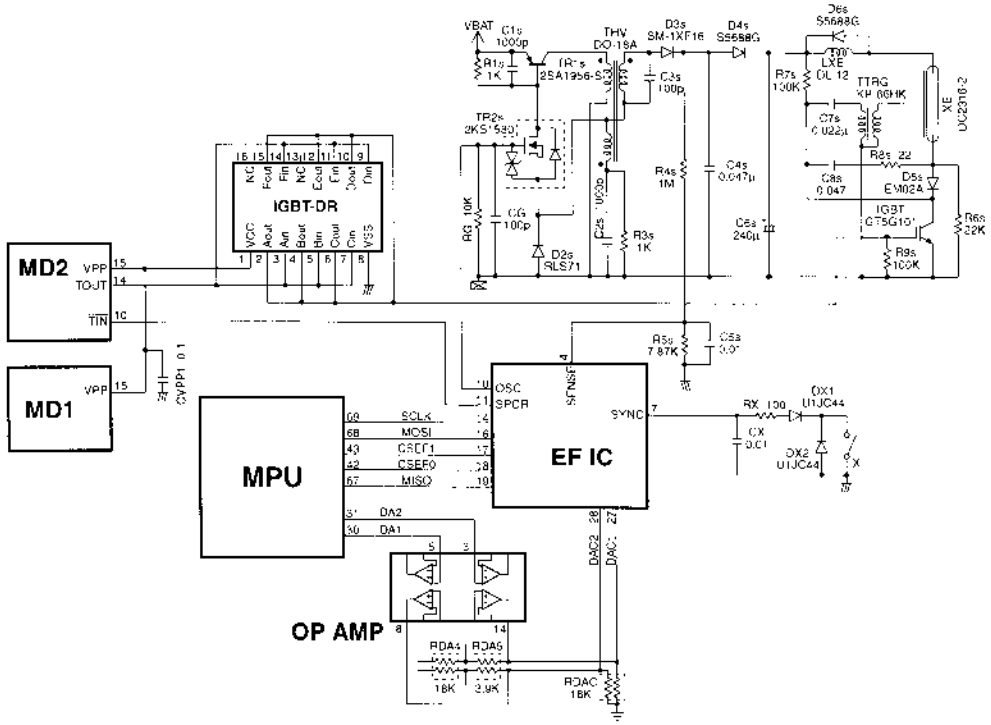


Fig. 2-31 Built-in Flash

2.11 FP Sync (with Speedlite 380 EX only)

1. Pre-flat* Firing
   The MPU via the EFIC orders the flash to fire a "pre-flat" flash. Pre-flat flash power and duration information is included. Immediately following the information transfer, the trailing (falling) edge of the signal on STSP is used as the flash trigger.
2. Main Flat* Flash
   The protocol for main flat-flash firing is the same as the pre-flat flash, but the trigger timing is different. The STSP leading edge signal fires the flash which extends the "flat firing" to cover the entire time span from the start of the first curtain run to the end of the second curtain run.
3. Normal main flash is the same as previous EOS system flashes.

*: "Flat" flash is a series of limited flashes that combine to approximate the long low output of the old FP flash bulbs for synchronizing with focal plane shutters. When viewed on an oscilloscope it appears as a long flat pulse instead as the very short peaky normal output of an electronic flash.

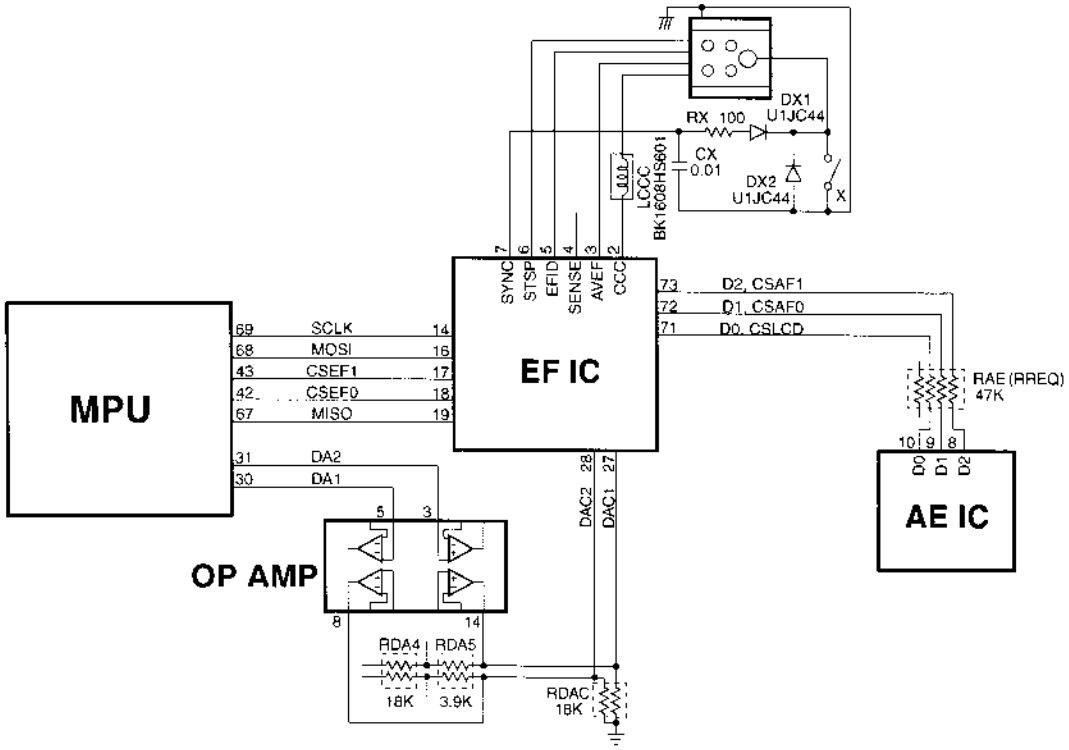


Fig. 2-32 FP Sync

2.12 Film Winding

1. The motor turns in reverse starting film winding.
2. The photoreflector PRFILM lights.
3. The MPU's PRAD port switches to level comparator mode.
4. When eight perforations are counted, the motor stops.
5. The film counter advances one count.
6. The motor phase switch stops at the flash position.

2.13 Film Rewinding

1. The battery is checked.
2. The motor turns forward to switch to the rewind phase.
3. The motor turns in reverse starting film rewinding.
4. The photoreflector PRFILM lights.
5. The MPU's PRAD port switches to level comparator mode.
6. When eight perforations are counted, the frame counter decreases one count.
7. When the frame counter reaches zero, the film leader timer operates.
8. The motor stops.
9. The motor phase switch stops at the flash position.

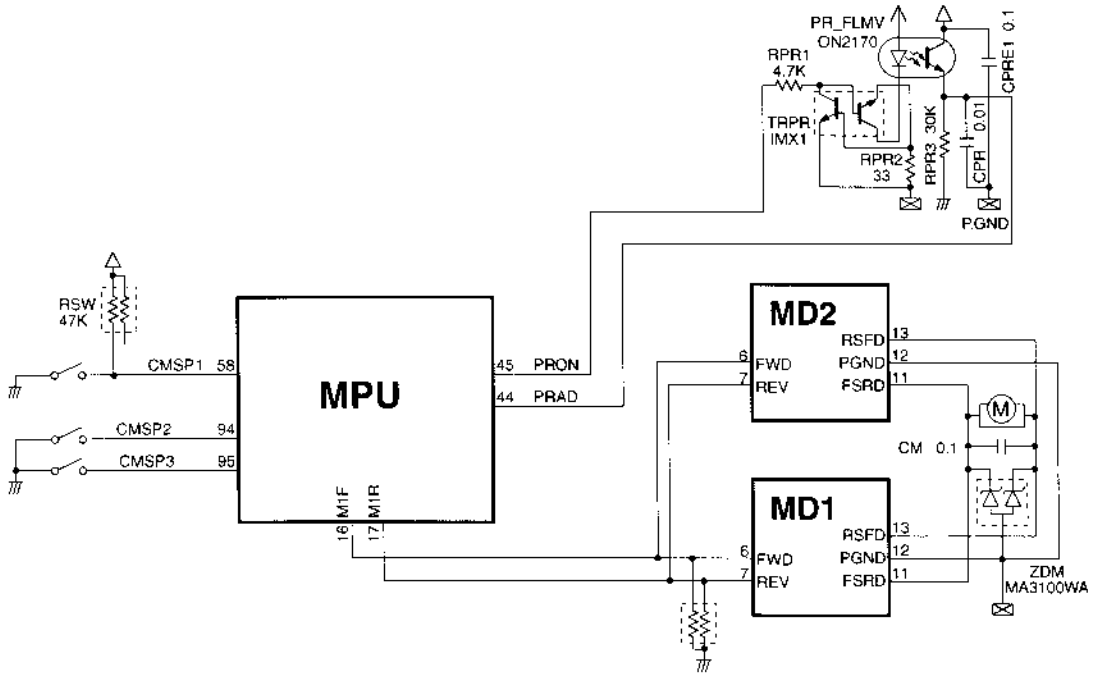


Fig. 2-33 Film Transport

3. SWITCH NOMENCLATURE AND FUNCTION

No.	Symbol	Switch Name	Function
Operation Buttons, Dials			
1	SW1	Ranging/Metering	Distance and exposure metering start
2	SW2	Release	Initiates exposure sequence
3	MAIN1, 2, 3, 4	Mode Select (Command Dial)	Select photographic mode, Main Switch turns off at "L".
4	LMES1, 2 SW	Metering Mode	Select metering mode
5	AFMODE1, 2 SW	AF Mode Select	Select AF mode
6	DRIVE SW	Film Winding Mode	Sets film winding mode, single or continuous
7	AELK SW	AE Lock	Locks in present exposure value (AE Lock remains while metering timer is working.)
8	AFSEL SW	AF Point Select	Allows the focusing point to be selected with the Main Dial.
9	MDIAL 1, 2 SW	Main Electrical Dial	Operated using in combinations with other switches, e.g., shooting mode, AF mode, metering mode
10	SUBON SW	Q. Control Dial On	Turns on/off the Quick Control Dial
11	SDIAL1, 2 SW	Quick Control Dial	For exposure and metering compensation
12	SELF SW	Self-timer, Remote	Allows self-timer or remote control shooting
13	POPUP SW	Flash up	Built-in flash pops up
14	RBTN SW	Manual Rewind	Initiates manually induce powered rewind
15	FUNC SW	Function	Sets film speed, AEB, etc.
16	PANORAMA SW	Panorama	Sets to Panorama mode
Internal Switches			
17	BP SW	Back Cover	Low when the back cover is open
18	CMSP1, 2, 3 SW	Motor Phase	Switches modes, shutter charge, mirror position, film winding, and built-in flash lifting
19	BAT SW	Reset	Resets ICs when the battery is installed.
20	MIF SW	Mount Interface	Lens sensor – On when a lens is attached.
21	SHBUSY SW	External Flash	Senses when an external flash is mounted.
22	POPEND SW	Pop-up End	On when the built-in flash is up
23	POPCTR SW	Pop-up Control	The motor stops after High-Low-High sequence
24	X SW	X sync	Flash trigger switch
25	CN2 SW	2nd Shutter Curtain	Senses completion of 2nd curtain travel
26	DX1-5 SW	DX Code	Reads film speed portion of the DX code
27	PTIN SW	Film Cartridge	Film cartridge sensor – Open when a cartridge is installed.

4. IC PIN DESCRIPTIONS

MPU (MB90233)

Pin	Name	Function
1	SPLED2	Superimpose SPLED2 emitter
2	SPLED3	Superimpose SPLED3 emitter
3	ACK.CSGERO	Eye-control adjustment signal
4	PCBUSY	Eye-control adjustment signal
5	SLEEP	MPU operation mode monitor
6	/VB2ON	Control signal for lens power application
7	ICNT0	Current limiter for Eye-control IRED
8	ICNT1	Current limiter for Eye-control IRED
9	DGND	Digital ground
10	ICNT2	Current limiter for Eye-control IRED
11	ICNT3	Current limiter for Eye-control IRED
12	ICNT4	Current limiter for Eye-control IRED
13	PLED	Emitter for 4 panorama LEDs
14	ENA2	Emitting control for the eye-control IRED
15	/LATCH	Communication control for eye-control IRED driver
16	M1F	Motor control signal
17	M1R	Motor control signal
18	FLED	Luminance control for the viewfinder LED and the panorama LED
19	AUXLED	AF auxioury LED control signal
20	SPLMD	Luminance control for the superimpose LED
21	VDD	Power supply
22	ENA1	Eye-control IRED emitter
23	YV	Eye-control Y-BASIS control signal
24	YH	Eye-control Y-BASIS control signal
25	/CSY(ADTRG)	Chip selector for Eye-control Y-BASIS communication
26	ESI	EEPROM serial data input
27	ESO	EEPROM serial data output
28	ESK	EEPROM clock output
29	ECS	EEPROM chip select signal output
30	DA1	D/A Converter output (Channel 1)
31	DA2	D/A Converter output (Channel 2)
32	E2	Analog power supply
33	VRH	Full-scale reference voltage for A/D and D/A (3.2V)
34	AGND	Analog ground
35	AGND	Analog ground
36	IRAD	Eye-control IRED emitting monitor
37	YOUT	Eye-control BASIS image signal input
38	AFAD	AF BASIS image signal input
39	AEAD	Analog exposure sensor signal input
40	DGND	Digital ground
41	EFAD	TTL sensor analog signal input
42	CSEF0	TTL sensor chip select signal
43	CSEF1	TTL sensor chip select signal
44	PRAD	Analog film winding photoreflector signal input
45	PRON	Film winding photoreflector control signal
46	SW2	Release switch
47	DGND	Digital ground
48	VDD	Power supply
49	DGND	Digital ground

Pin	Name	Function
50	/RESMPU	MPU reset signal input (from the LCD driver)
51	/LCDREQ	Communication request from the LCD driver
52	/FLASH	Flash firing signal (Not used)
53	MG3-1	1st shutter curtain release signal
54	MG3-2	2nd shutter curtain release signal
55	–	Not used
56	DATE	Date printing signal
57	/TINTE	AF BASIS accumulation completion signal
58	CMSP1	Motor phase signal
59	–	Not used
60	BCLK	Drive reference clock for BASIS, Y-BASIS, Y-LED IC, and EF IC
61	RXD	Serial communication: not used
62	TXD	Serial communication: not used
63	REDEYE	Red-eye reduction lamp emitter
64	LIN	Communications line to lens (input)
65	LOUT	Communications line from (output)
66	LCLK	Lens communications clock
67	MISO	Communications line from other ICs (input)
68	MOSI	Communications line to other ICs (output)
69	SCLK	Communications clock with other ICs
70	PANO	Date printing position shift signal (Set to panorama at Hi)
71	CSLCD, DO	LCD driver select and exposure sensor area select
72	CSAF0, D1	AF BASIS communications chip select/ exposure sensor area select
73	CSAF1, D2	AF BASIS communications chip select/ exposure sensor area select
74	CLK0	BASIS drive reference clock
75	–	Not used
76	CLK1	BASIS drive reference clock
77	CLK2	BASIS drive reference clock
78	READ	BASIS drive reference clock
79	DGND	Digital ground
80	FAR	16MHz oscillator connector
81	EFAR	16MHz oscillator connector
82	VDD	Power supply
83	/EXREQ	Tool communication request
84	PTIN	Film cartridge switch
85	SW1	Ranging/Metering start switch
86	LMES1	Metering mode select switch
87	LMES2	Metering mode select switch
88	AFMODE1	AF mode select switch
89	AFMODE2	AF mode select switch
90	DRIVE	Drive mode switch
91	PANORAMA	Panorama
92	SHBUSY	External flash sensor switch
93	POPCTR	Flash pop-up control switch
94	CMSP2	Motor phase signal
95	CMSP3	Motor phase signal
96	CN2	2nd curtain travel completion signal sensor
97	HVSW1	Camera framing detect switch
98	HVSW2	Camera framing sensor switch
99	VON	HV sensor current control
100	SPLED1	Superimpose SPLED1 emitter

LCD Driver (SN103932)

Pin	Name	Function
1	MAIN1	Command dial switch input
2	MAIN2	Command dial switch input
3	MAIN3	Command dial switch input
4	RBTN	Rewinidng switch input
5	SELF	Self-timer/ Remote control switch input
6	BP	Back cover sensor switch input
7	POPEND	Built-in flsh pop-up completion sensor switch input
8	MAIN4	Command dial switch input
9	LIN	Communicatons signal input from lens
10	/RESIO	EF IC reset signal input
11	/RESMPU	MPU reset signal output
12	/LCDREQ	Cut-in communication request output to MPU
13	/E1ON	DC/DC operation start signal
14	MIF	Mount interface switch input
15	POPUP	Built-in flash up switch input
16	AFSEL	AF mode switch input
17	AELK	AE lock switch input
18	SW1	Release switch 1 (metering/raning) input
19	FUNC	Function switch input
20	BEEP	Beeper connector
21	REMIN	Remote control signal input
22	/REMON	REM IC power supply signal
23	TEST	Ground connector (not used)
24	XTAL1	32kHZ oscillator connection
25	XTAL2	32kHZ oscillator connection
26	PUC	LCD driver set signal
27	SDIAL2	Back cover dial input
28	SDIAL1	Back cover dial input
29	MDIAL2	Command dial input
30	MDIAL1	Command dial input
31	CHP1	Booster capacitor connector
32	CHP2	Booster capacitor connector
33	CHP3	Booster capacitor connector
34	VH	Booster capacitor output
35	VM	Booster capacitor output
36	VL	Booster capacitor output
37	GND	Ground
38–61	SEG29-SEG6	Segment drive terminals
62	–	Not used
63–66	SEG4-SEG1	Segment drive terminals
67	SEG30	Segment drive terminal
68	COM3	LCD common drive terminal
69	COM2	LCD common drive terminal
70	COM1	LCD common drive terminal
71	CSLCD	MPU selects a communication with LCD driver.
72	SCLK	Communications clock
73	MOSI	Communications line (input)
74	MISO	Communications line (output)

EF-IC (LC4090)

Pin	Name	Function
1	IREF	Current reference
2	CCC	External flash charge completion signal
3	AVEF	External flash aperture signal
4	SENSE	Built-in flash DC/DC voltage feedback
5	EFID	External flash communication signal
6	STSP	External flash starting and completing controller
7	SYNC	Shutter X sync trigger
8	STCR	Not used
9	DGND	Digital ground
10	OSC	Built-in flash charge controller
11	SPCR	Built-in flash termination Signal
12	BCLK	Reference clock input
13	E1	Logic circuits power supply
14	SCLK	Communications clock input
15	DGND	Digital ground
16	MOSI	Communication line (input)
17	CSEF1	Communications chip selector
18	CSEF0	Communications chip selector
19	MISO	Communication line (output)
20	/RES2	E1 voltage sensor output
21	PWR	VBAT voltage sensor output
22	E2	Analog power supply
23	VBAT	Power Supply (battery)
24	AGND	Analog ground
25	VRH	A/D reference voltage output (3.2V)
26	EFAD	Analog data output (TTL data)
27	DAC1	D/A input
28	DAC2	D/A input
29	VC	Reference Voltage (1.2V)
30	AGND	Analog ground

Part 3

Repair Information

1. REPAIR PREPARATIONS

IMPORTANT! READ THIS BEFORE STARTING REPAIR

1.1 BLEED THE MAIN CAPACITOR!

As soon as the top cover is removed, drain the main flash capacitor with a bleeder capacitor of around 500Ω and at least 10W. The points are on the flash connecting flex at the trigger ground lead pad (blue) and the flash tube XE+ lead (red) pad, as shown below.

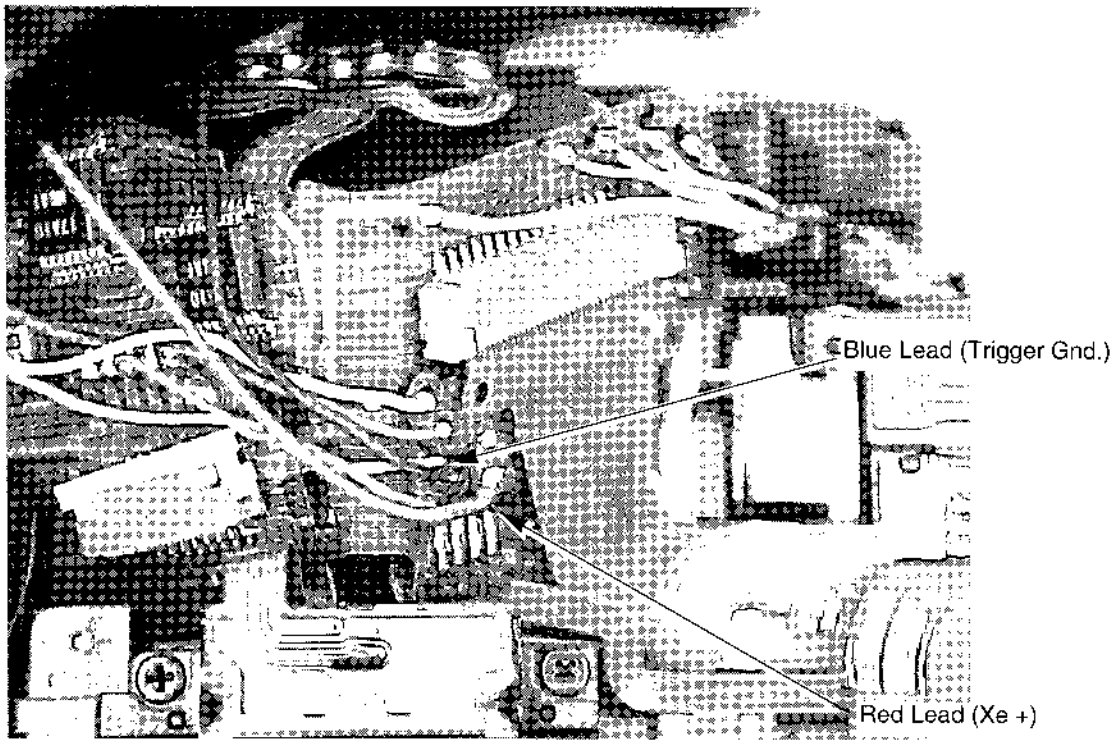


Fig. 3-1 Main Capacitor Bleed Points

1.2 OPERATION WITH TOP COVER REMOVED

1. Camera Operation

If the top cover has been removed and leads and connectors between the cover and main flex disconnected, the camera will not operate. To operate the camera without the top cover in place, you should construct the "Command Dial Tool" following the instructions on page 3-7.

2. Shutter Release

To prevent possible harm to the switch, use the accessory "Release Switch RS-60E3 to release the shutter when the top cover is off.

1.3 CURRENT CONSUMPTION

The current consumption product standards and actual average measured values are listed below.

Lens: EF50mm/1.8

Power source: Constant voltage source 5.4 V, 0.7Ω

Film: New Tri-X (36-exp..) (during prewind or winding check).

	Product standard	Measured range
Standby (including LOCK)	50μA	30-40 μA
SW1 ON	150mA	60-70 mA
Self timer	200mA	60-70 mA
Battery Check	1200 ± 200 mA	1000 ± 100 mA

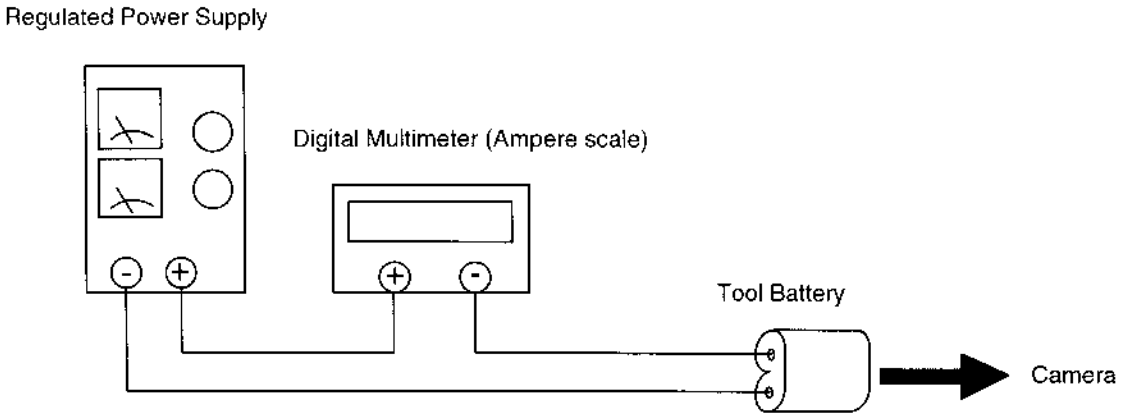


Fig. 3-2 Current Consumption Test Set-up

1.4 TOOLS and EXPENDABLES

The following tools and expendables are required to reassemble and adjust.

1. Tools

New	Test Equipment		Part No.	Adjustment
	HS-I/F		CY9-7082-000	Electrical adjustment
	EF-8000 Multi-camera Tester		CY9-7073-000	Shutter, AE adjustment
	Universal 90° Collimator-3		CY9-7077-000	Sub-Mirror 42° adjustment
	Sub-mirror Gage (42°)		CY9-7077-006	Sub-Mirror 42° adjustment
	DC Power Supply (Model 532c)		CY9-7038-000	Electrical adjustment
	Dummy Battery Pack		CY9-7079-000	Inhibit Voltage adjustment
	Tool Battery Probe Kit (0.83Ω)		CY9-7089-000	Inhibit Voltage adjustment
	Dial gage		CY9-1001-006	Flange-Focal Plane Distance (FFD) adjustment
	Block gage (44.14 mm)		CY9-1001-007	FFD adjustment
	Auxiliary ring		CY9-1001-008	FFD adjustment
	Optical flat		CY9-1001-003	FFD adjustment
	EF50mm $f/1.8$ lens (not type II)			
	18% gray paper			Exposure adjustment
	Reflectance paper	2%	CY9-1066-000	AF adjustment
		64%	CY9-1067-000	AF adjustment
		90%	CY9-7076-000	AF adjustment
	Flash Meter			Flash Exposure adjustment
	Mask Holder		CY9-1097-000	Eye-Control Focus adj.
	CCD Adj. Chart (EOS 5)		CY9-7088-000	Eye-Control Focus adj.
•	IRED Alignment Tool		CY9-1106-000	Eye-Control Focus adj.

2. Expendables

New	Expendable	Part No.	Use
	Bond G103	CY9-8002-000	Joining of front panel light shield screen, hot shoe spring, Hot shoe screws
	Aron Alpha 201	CY9-8007-000	Fixing of SPC
	Arontite L	CY9-8008-000	Flash fixing screw
	Three Bond 1401C	CY9-8011-000	Screw lock for top cover
	Three Bond 1401B	CY9-8012-000	Screw lock for trans. motor
	Silicone Bond KE347B	CY9-8064-000	Pentaprism fixing
	PL015JG	CY9-8073-000	Spool, Prewind base
	H-26	CY9-8079-000	Dial shaft, Release button shaft, Gear shafts, etc.
	Logenest Lambda A-74	CY9-8102-000	Gears friction surfaces, etc.

1.5 Locally Fabricated Tools

Make the following charts from paper of the reflectance indicated.

1. AF Charts

•AF reference chart

Place 90% white strips centered on on 2% black paper as shown.

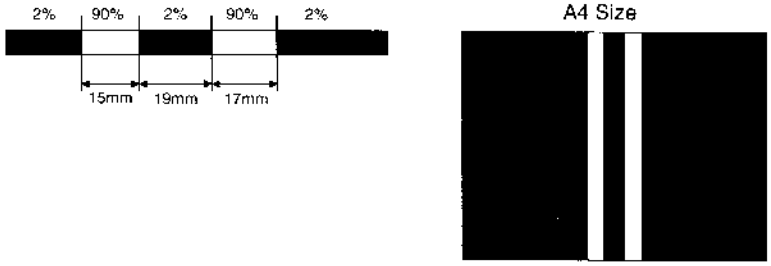


Fig. 3-3 AF Reference Chart

•16mm bar chart (AF accuracy check)

Attach 16mm 90% paper vertically to 2% A4 paper as shown below.

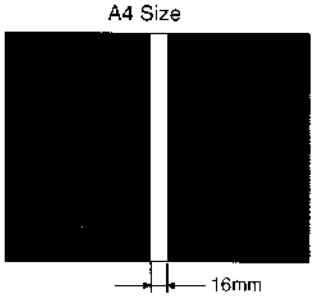


Fig. 3-4 Single Bar (16mm) Chart

•45° bar chart (AF accuracy check)

Attach 16mm 90% paper diagonally to 2% A4 sheet as shown below.

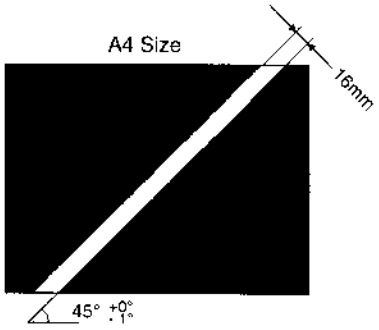


Fig. 3-5 45° Bar Chart

•Low-contrast chart (AF accuracy check)

Make chart a center 15mm wide 90% white over a 64% light gray background.

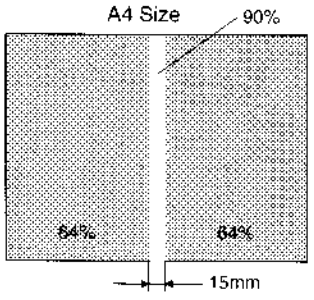


Fig. 3-6 Low Contrast Chart

AGC Chart

This is the same chart used with the EOS 5. Construct as shown as shown

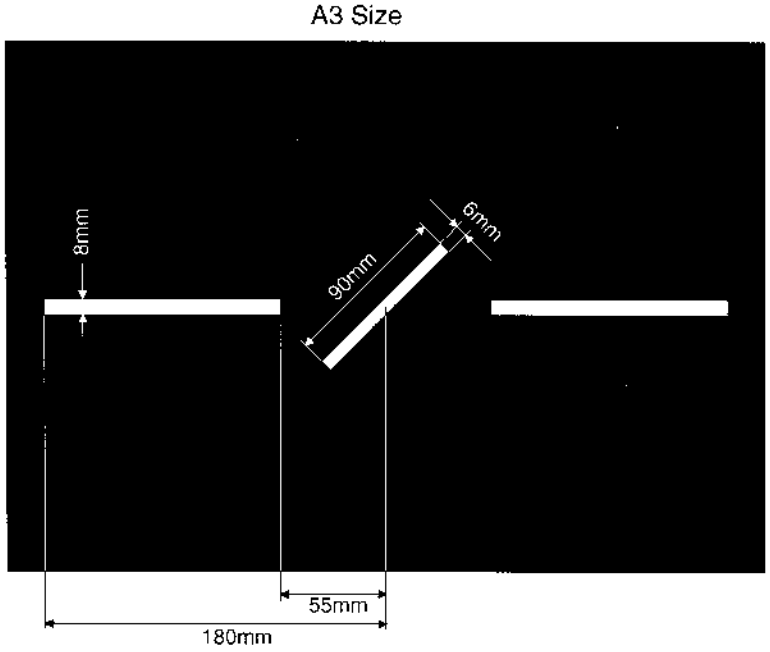


Fig. 3-7 AGC Chart

2. X-Sync Time Lag Check Tool

This kludge is used for measuring X sync time lag. Use a flash accessory shoe with a 4.7kΩ resistor from the CCC terminal to ground and leads attached as shown.

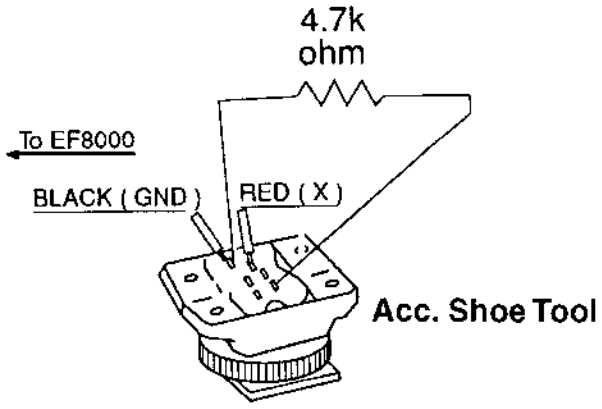


Fig. 3-8 Accessory Shoe Tool

3. Dummy Battery Assembly

Construct this dummy battery assembly as shown from the Dummy Battery Pack (CY9-7079-000) and Tool Battery Kit (CY9-7089-000). Do not substitute parts as the set is matched to replicate the 0.83Ω internal resistance of a 2CR5 battery.

(The diode and capacitor provide additional protection for the camera circuitry.)

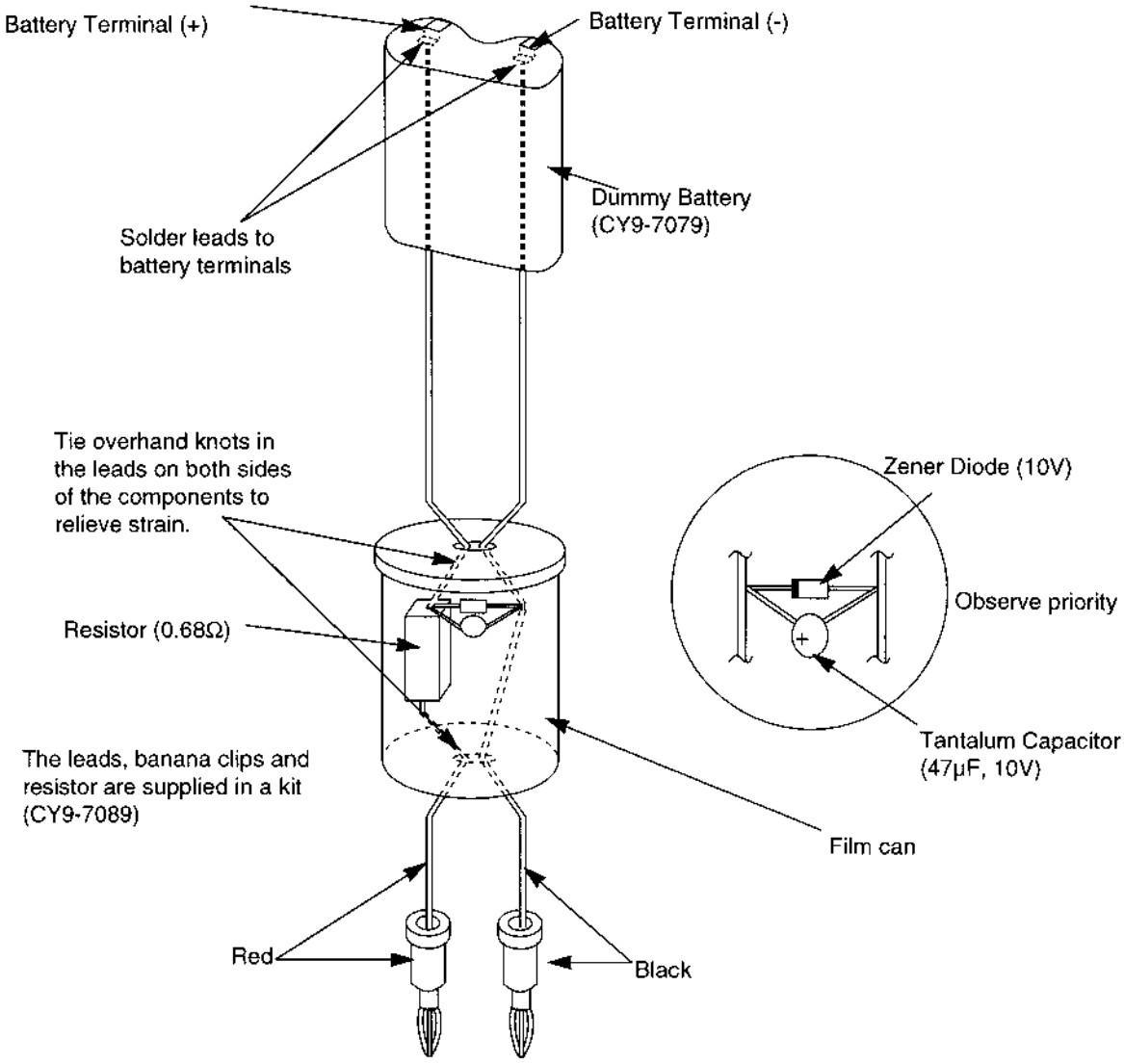


Fig. 3-9 Dummy Battery Assembly

4. Command Dial Tool

To operate the camera without the top cover in place, you should construct this "Command Dial Tool" by modifying a Top Flex (CH1-6658). Place jumpers between GND and MAIN 2 and MAIN 3, and jumper GND to X.GND on the Main Flex. Plug this modified Top Flex into the connector on the main Flex. The camera will now be in the MANUAL (M) mode.

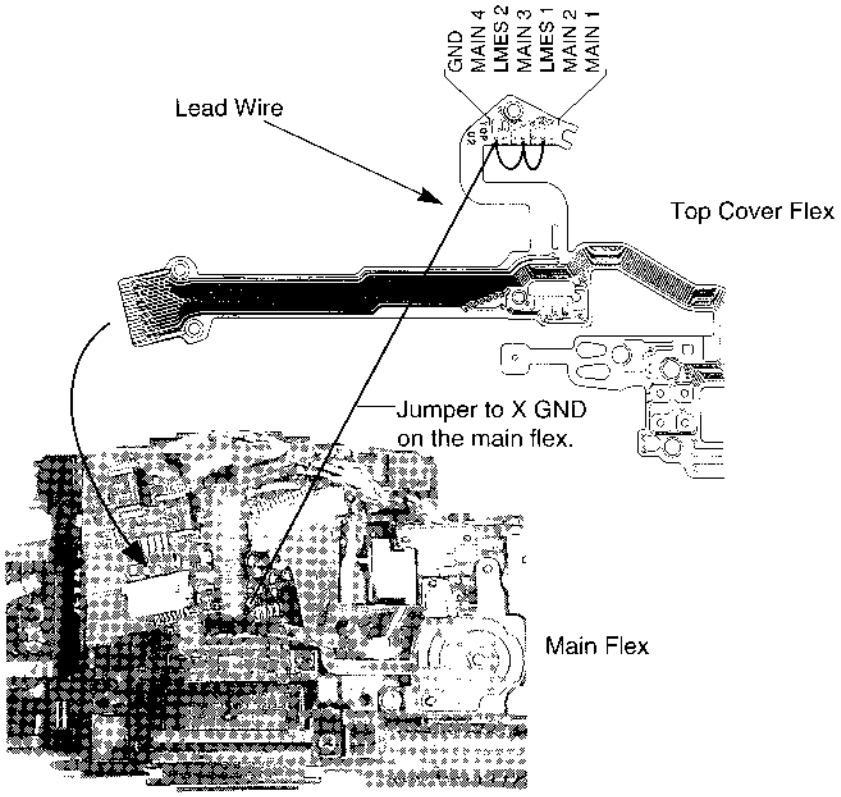


Fig. 3-10 Command Dial Tool

Table 3-1 Command Dial Phasing

Command Dial	MAIN 1	MAIN 2	MAIN 3	MAIN 4
CAL	High	High	Low	Low
CF	Low	High	Low	High
DEP	Low	Low	Low	High
M	High	Low	Low	High
AV	High	Low	High	High
TV	Low	Low	High	High
P		High	High	High
L(Lock)	High	High	High	High
	High	High	High	Low
	Low	High	High	Low
	Low	Low	High	Low
	High	Low	High	Low
	High	Low	Low	Low

2. ASSEMBLY & DISASSEMBLY

2.1 External Cover Removal -1

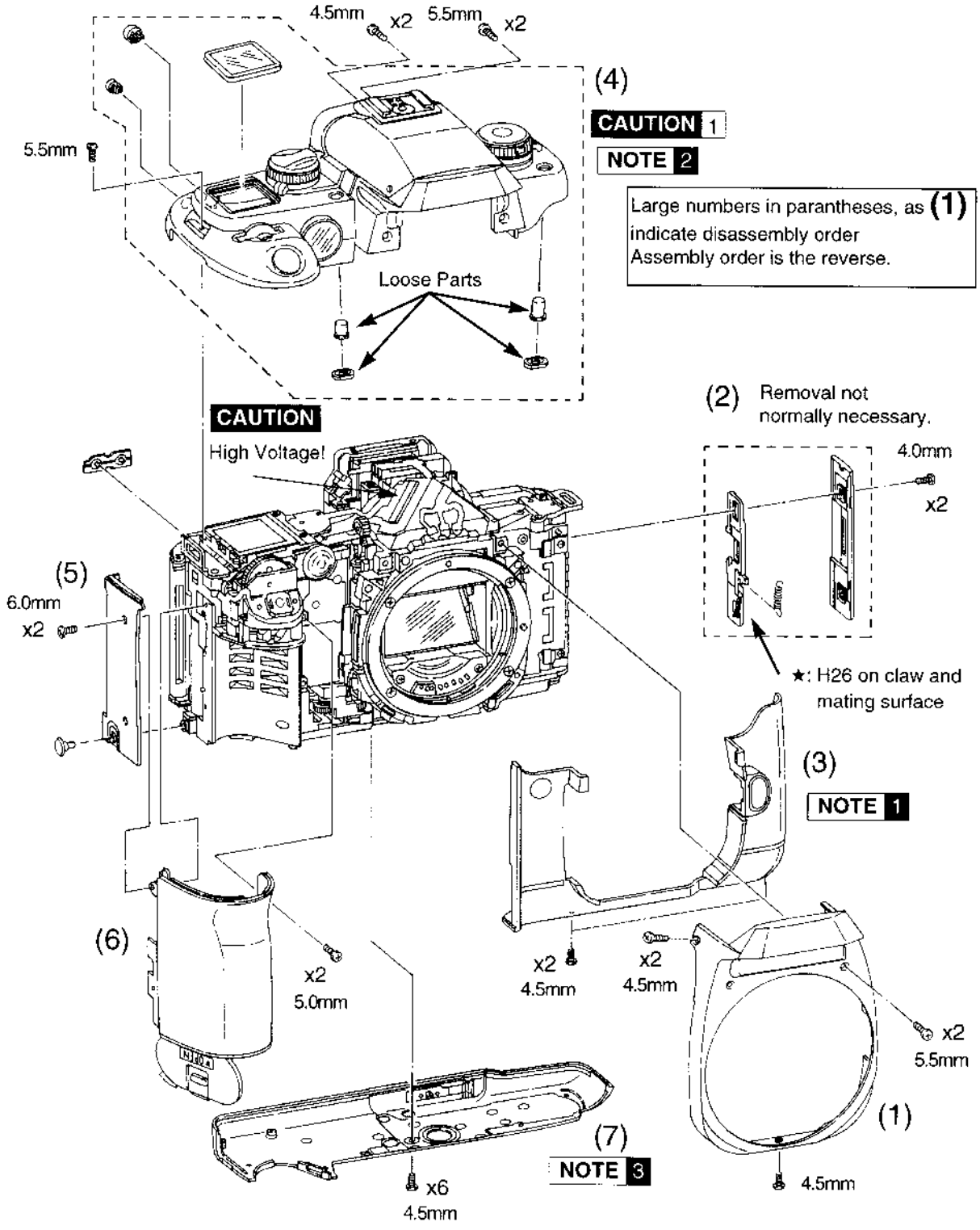


Fig. 3-11 External Covers

Assembly & Disassembly Notes

NOTE 1 : Discharge the main flash capacitor!

Always drain the main flash capacitor as soon as the top cover is removed.

NOTE 1 : Front Cover (3) Removal

Loosen, but do not remove, the screws holding the back cover latch cover. This cover does not need to be removed for most work.

NOTE 2 : Top Cover (7) Removal

1. Remove the four eyepiece screws (2 black, 2 chrome).
2. Remove the screw at the right end strap lug.
3. Lift the top cover. Disengage the grip clip from the top cover clip hole before removing the top cover.
4. Discharge the main capacitor!
5. Unsolder the five leads from the camera as shown in Figure 3-12.
6. Disconnect the flash connector.

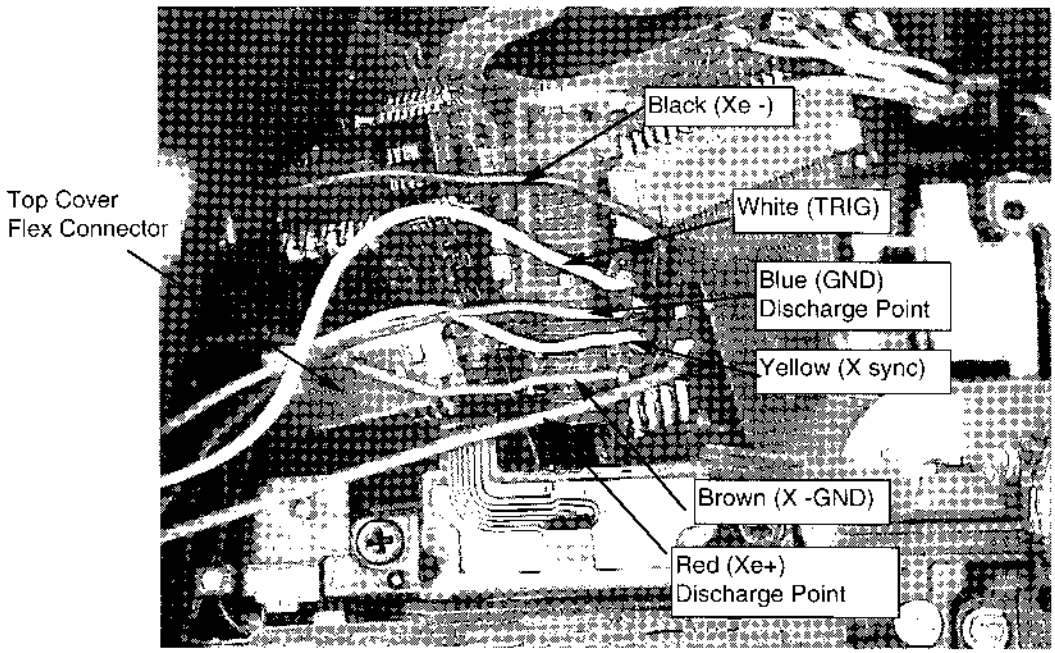


Fig. 3-12 Lead Wiring and Main Capacitor Bleeding

NOTE 3 : Bottom Cover Installation (EOS 55 only)

When reinstalling the bottom cover, insure that the Panorama lever in the cover and the panorama switch are properly coupled.

2.2 Mirror Box Unit Removal

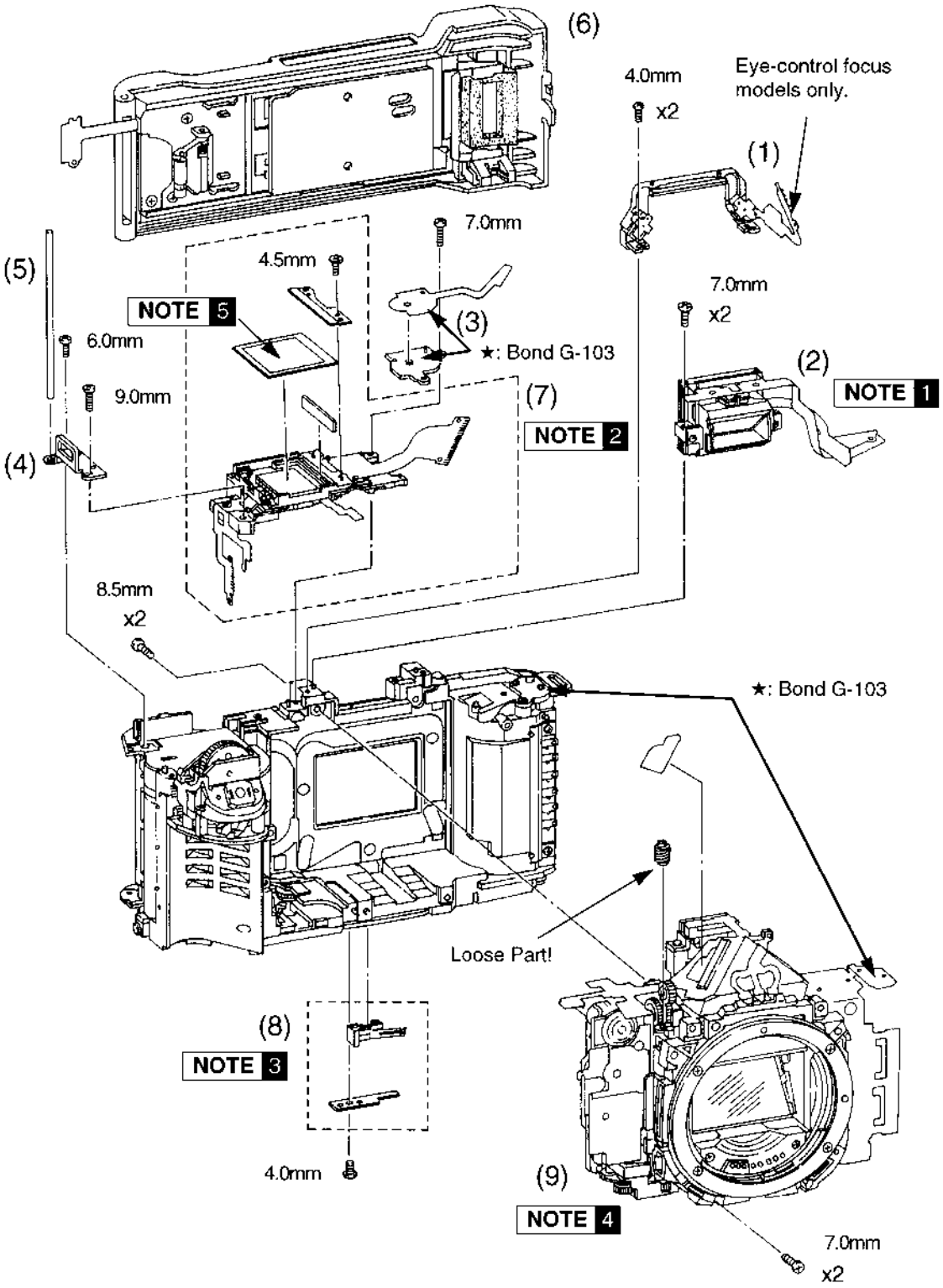
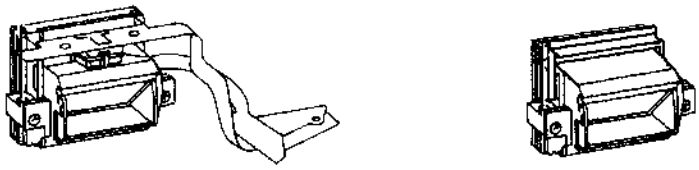


Fig. 3-13 Mirror Box Removal

Assembly & Disassembly Notes

NOTE 1 : Eyepiece Unit Removal

There are two different eyepiece units, for cameras with and without Eye-control AF. When removing the Eye-controlled Focus Eyepeice, the main flex comb connector must be unsoldered.



Eye-controlled Focus Eyepeice

Normal Eyepeice

Fig. 3-14 Eyepiece Units

NOTE 2 : LCD Unit Removal

1. Remove the AF mode dial flex (3) (one screw). and unsolder the main flex comb connector.
2. Remove the right end (vertical) strap lug(4) (2 screws).
3. Unsolder the back cover flex (Fig. 3-15).
4. Unsolder the viewfinder LCD flex.
5. Unsolder three leads from the remote terminal (Fig. 3-15).
6. Unsolder the release flex and electronic control dial (Fig. 3-15).
7. Unsolder the DC/DC flex.

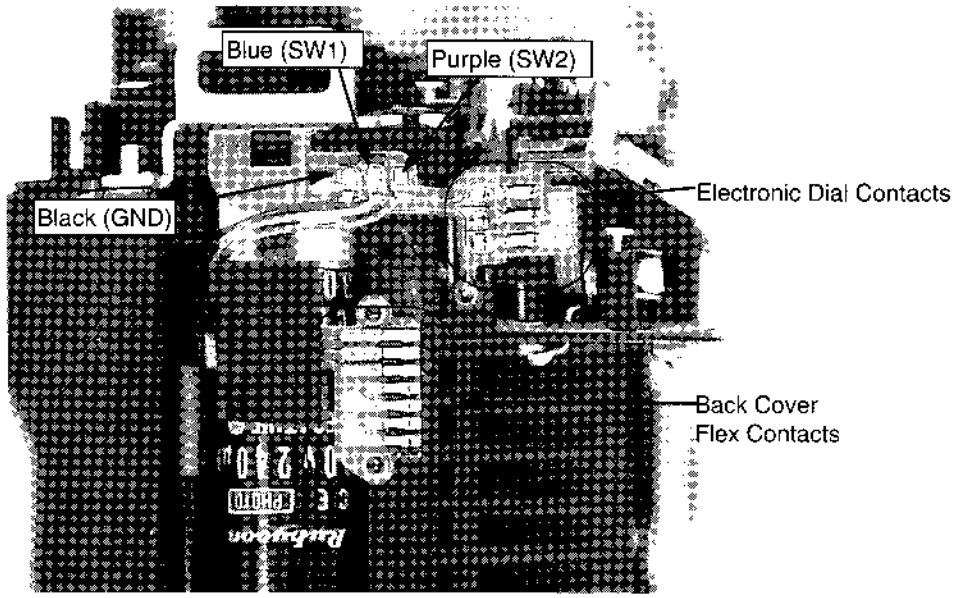


Fig. 3-15 LCD Flex

NOTE 3 : Panorama Switch Installation (EOS 55 only)

Install the mirror box before installing the Panorama Switch. If the switch is installed on the mirror box and then the box is installed in the body, the switch may be bent.

NOTE 4 : Mirror Box Unit

(1) Mirror Box Removal

1. Remove the flash connecting flex, which is mounted on the main flex.
2. Remove the motor leads.
3. Unsolder the main flex from the flash circuit board at two places (Fig. 3-16).
4. Unsolder the signal unit from the flex (Fig. 3-16).
5. Unsolder the DC/Dc flex from the two battery contacts (Fig. 3-16).
6. (EOS55) Unsolder the two panorama switch leads (Fig. 3-17).
7. Unsolder the back cover switch flex (Fig. 3-17).
8. Unsolder the DX contact thru-hole connections.

(2) Mirror Box Installation

When installing the mirror box, make sure that the shutter and mirror mechanisms are charged, and that the black lever and planet gear in film transport gear train is in the rearward position.

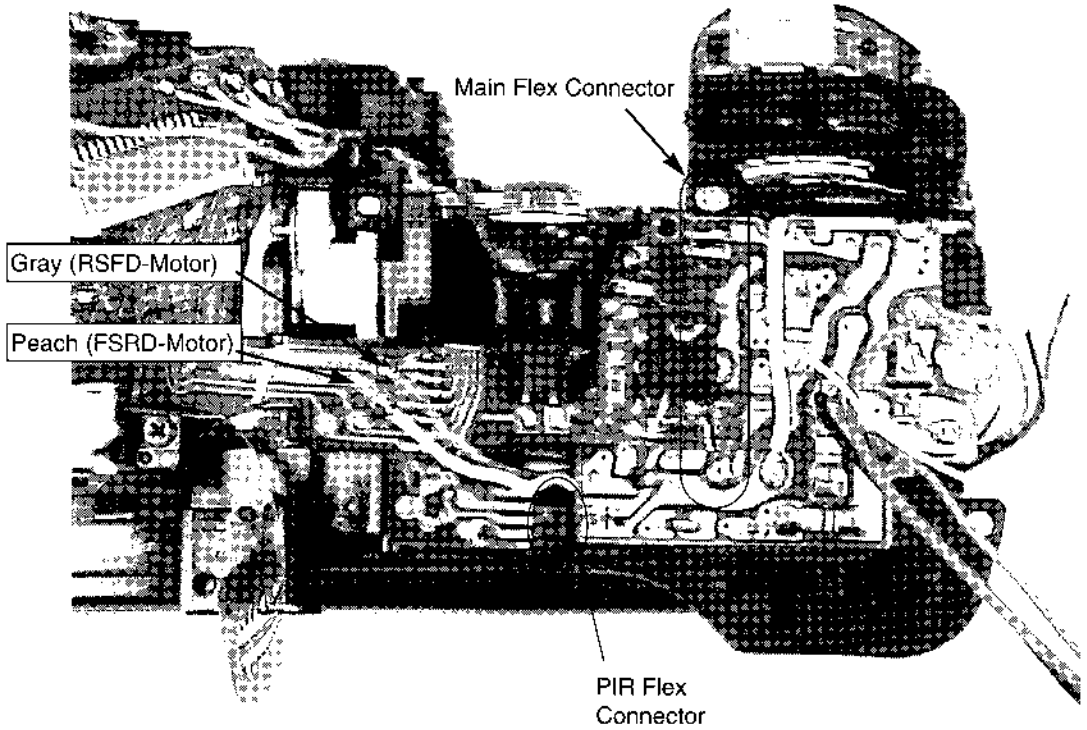


Fig. 3-16 Motor Leads

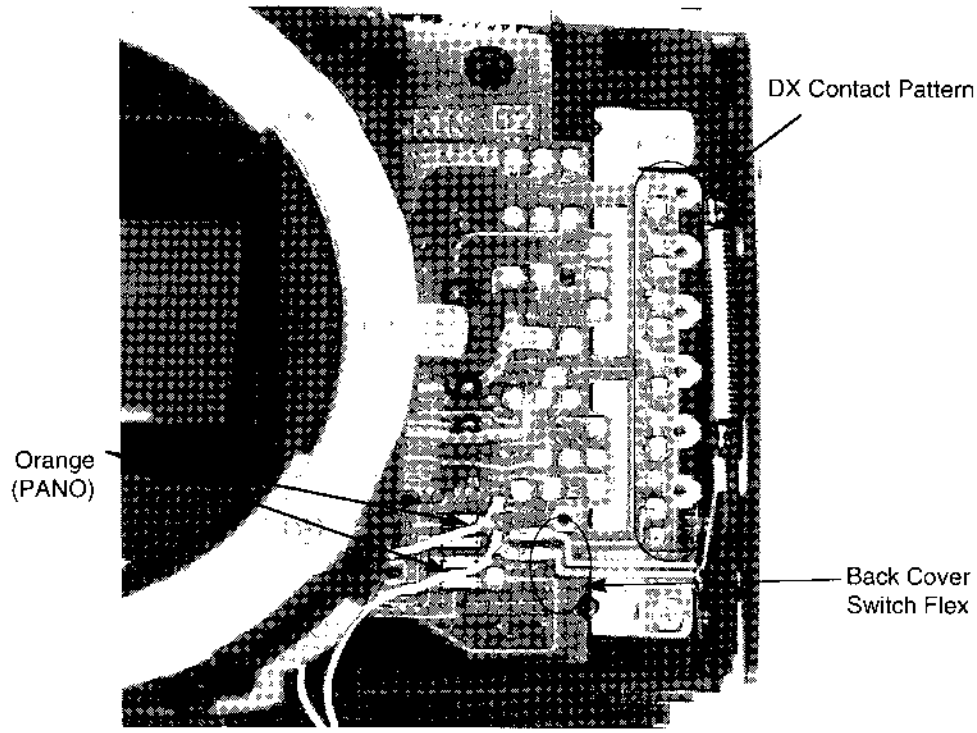


Fig. 3-17 DX Contacts

NOTE 5 : LCD Installation

1. The LCD normally need not be removed.
2. When installing the LCD, push it toward before tightening.

2.3 Main Flex Unit Removal

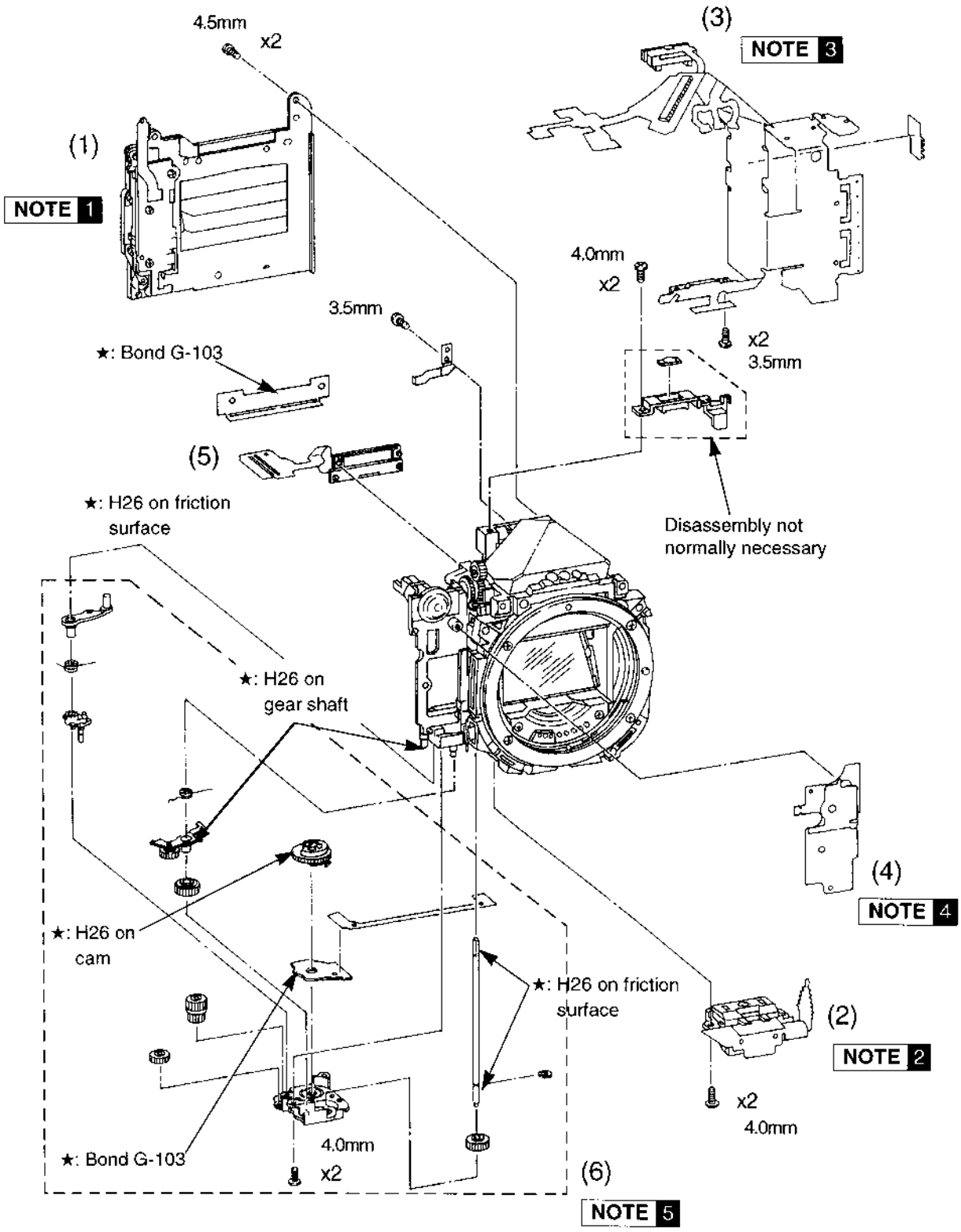


Fig. 3-18 Main Flex Removal

ASSEMBLY & DISASSEMBLY NOTES

NOTE 1 : Shutter Unit Removal

Unsolder the shutter from the main flex.

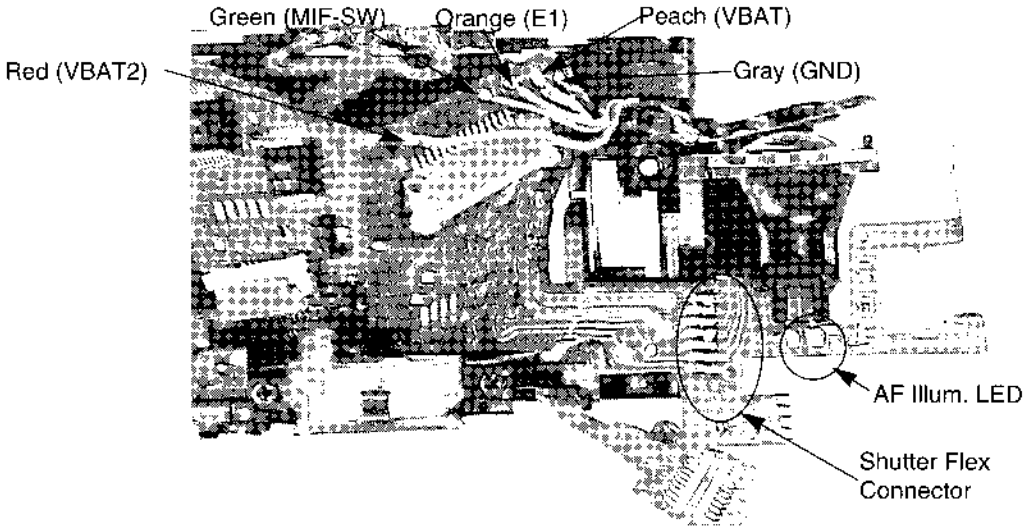


Fig. 3-19 Main Flex (Upper)

NOTE 2 : AF Unit Removal

- When the AF Unit is disturbed, the AF Sensor Position adjustment is necessary. See the Mechanical Adjustments section.

1. Unsolder the comb connector with the main flex.
2. Remove the filter coil leads from the MIF unit (Fig. 3-20).

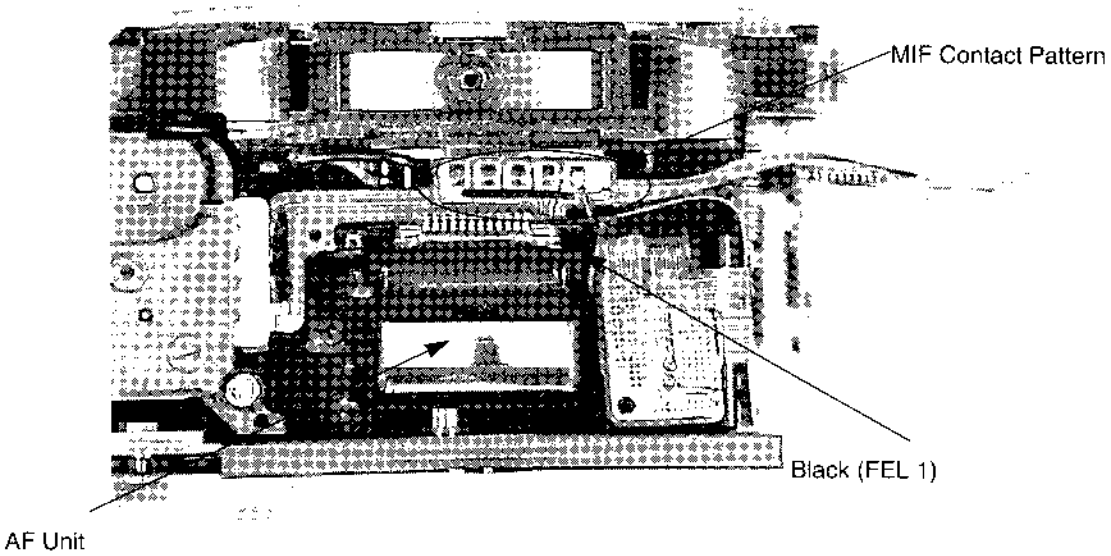


Fig. 3-20 Main Flex (Lower)

NOTE 3 : Main Flex Removal

The main flex can be removed with the AF Unit attached, or after the AF Unit is removed. This procedure is with the AF Unit attached.

1. Unsolder the AF Unit comb connector.
2. Remove the Phase Circuit Board connecting flex.
3. Unsolder the MIF Unit (Fig. 3-20).
   Remove the filter coil leads from the MIF unit (Fig. 3-20).
4. Unsolder the AF-Illuminator LED (Fig. 3-19).
5. Remove five leads from the upper part of the main flex.
6. Unsolder the SI-LED connections (Fig. 3-19).
7. Remove four leads from the Panorama LED.
8. Remove two screws from the MIF Unit, and push the MIF unit out of the lens mount as far as possible.
9. Remove two screws from the TTL flash sensor, sliding it sideways and pulling it out.

*: When reinstalling the TTL flash sensor, do not pinch the AF Units light shield sheet.

*: If the AF Unit is removed prior to removing the main flex, step 8. is not necessary.

NOTE 4 : DC/DC flex Removal

1. Unsolder the red MIF-SW lead (Fig. 3-21).
2. Unsolder the black LENS-GND lead.
3. Unsolder the mount lug.

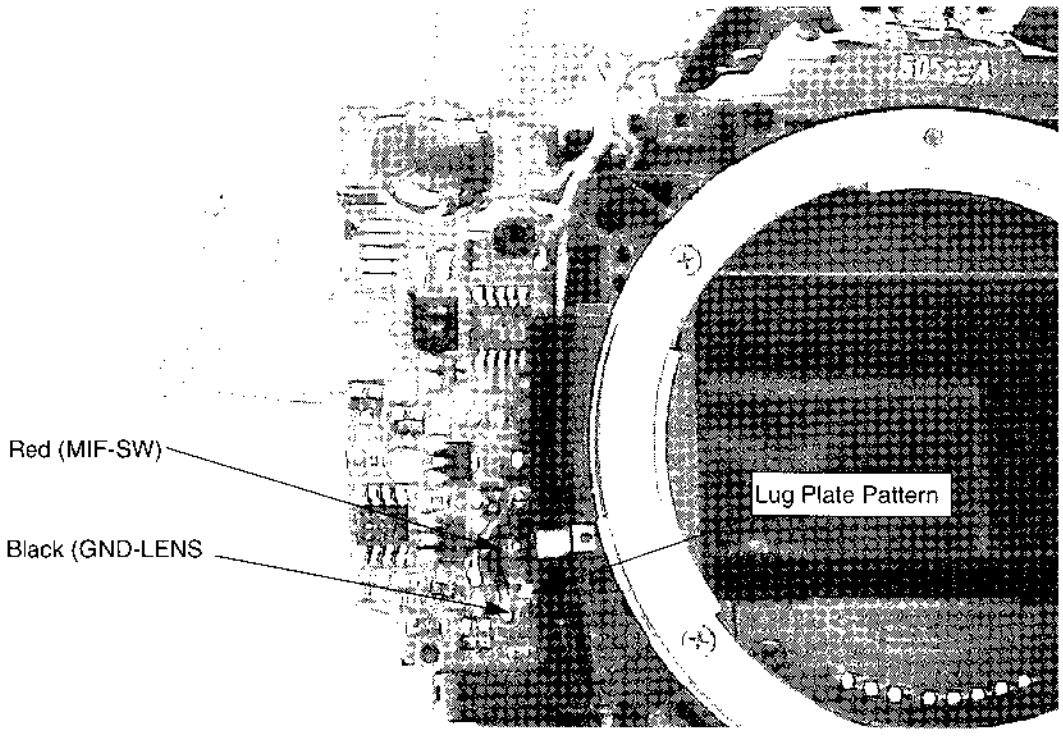


Fig. 3-21 DC/DC Flex

NOTE 5 : Charge Gear Train Assembly and Disassembly

- During disassembly, take care to not bend the phase switch contacts on the cam gear.
- During reassembly, insure that the springs are installed correctly.

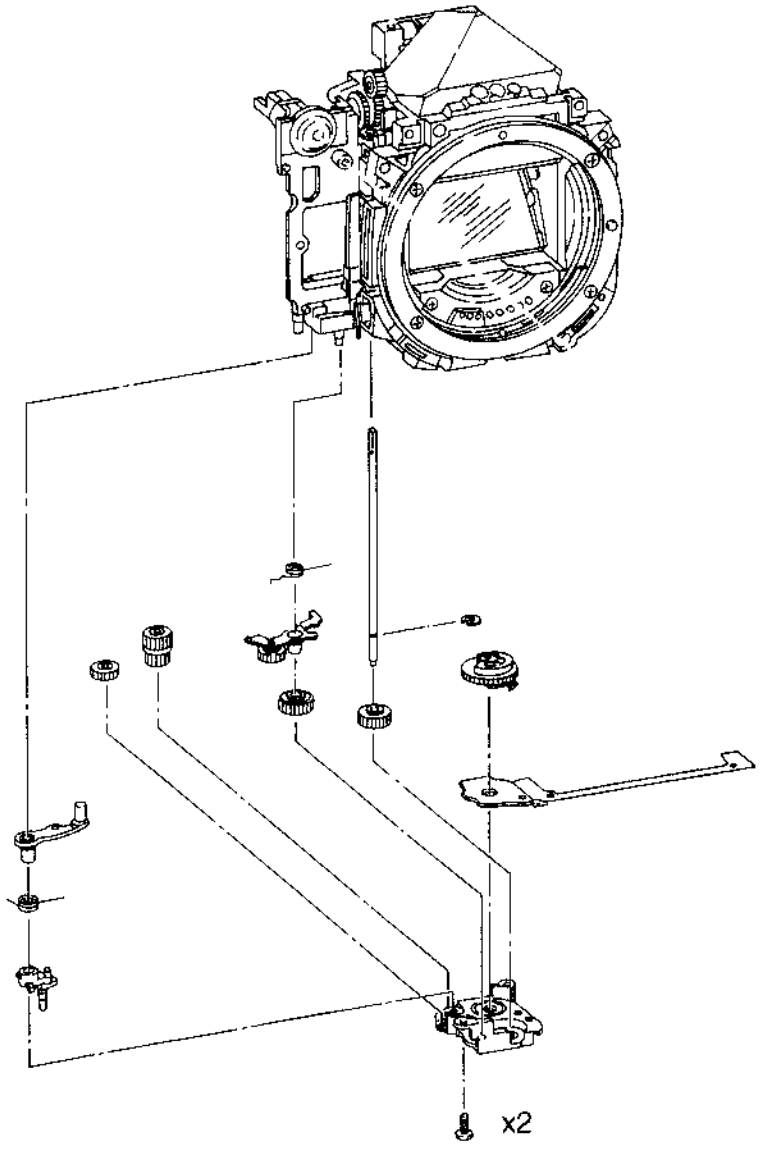


Fig. 3-22 Shutter / Mirror Charge Gear Train

2.4 Mirror Box Disassembly-1

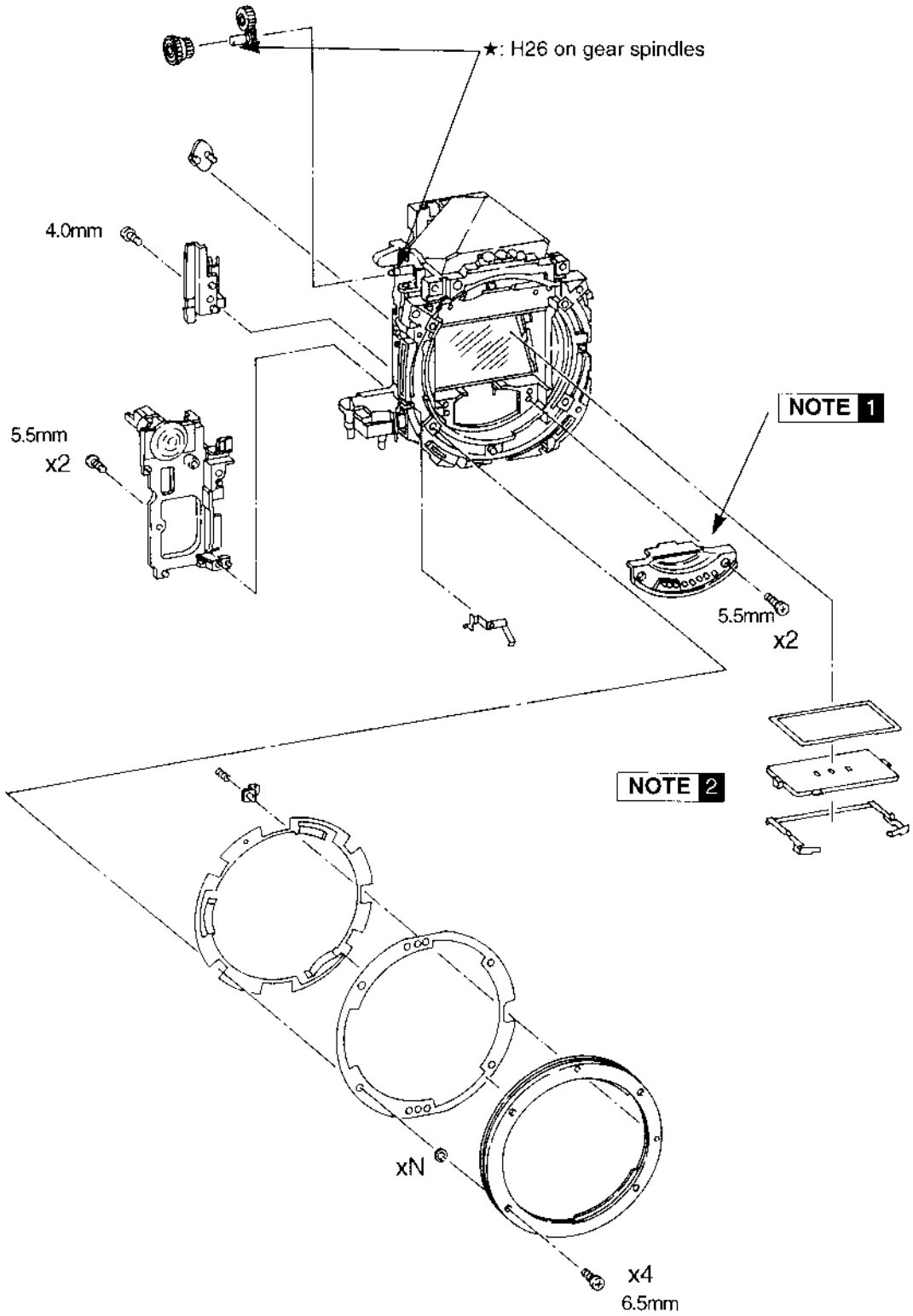


Fig. 3-23 Mirror Box - 1

Assembly & Disassembly Notes

NOTE 1 : MIF Contact Block Installation

When installing the contact block, put enough slack in the pin leads to allow proper pin movement and secure the leads with Bond G-103.

(CE) The user safety filter coil is installed as shown in figure 3-24.

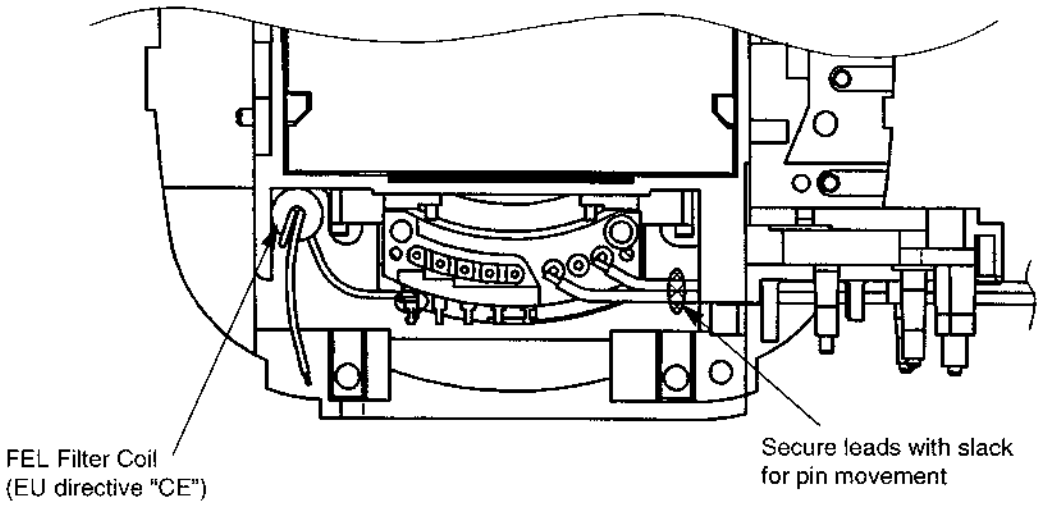


Fig. 3-24 MIF Unit

NOTE 2 : Focusing Screen Installation and Removal

- Insert tweezers in the holes in the focusing screen holder and gently remove it.
  * Excess pressure can bend the holder.
  * Do not scratch the focusing screen.
- When reassembling, make sure the focusing screen, focus washers, and holder are all squarely in place and installed in the correct direction.

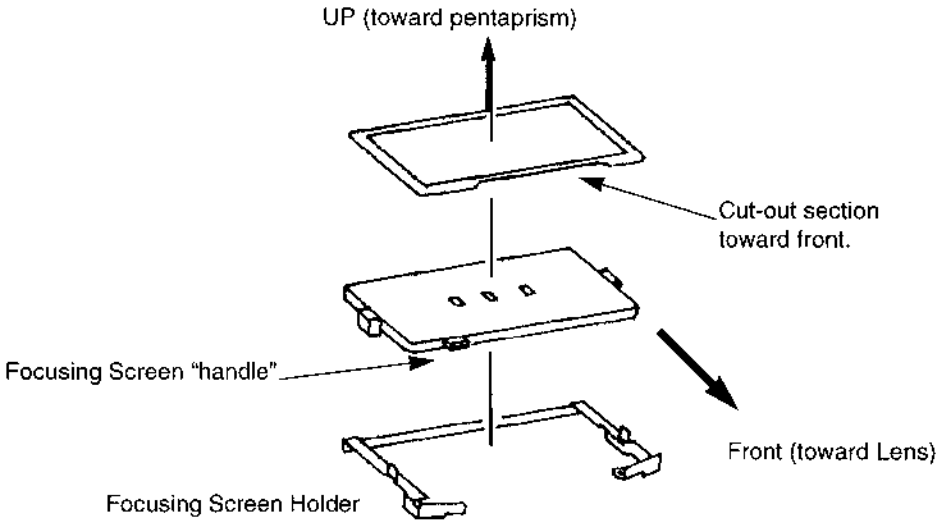


Fig. 3-25 Focusing Screen

2.5 Mirror Box Disassembly-2

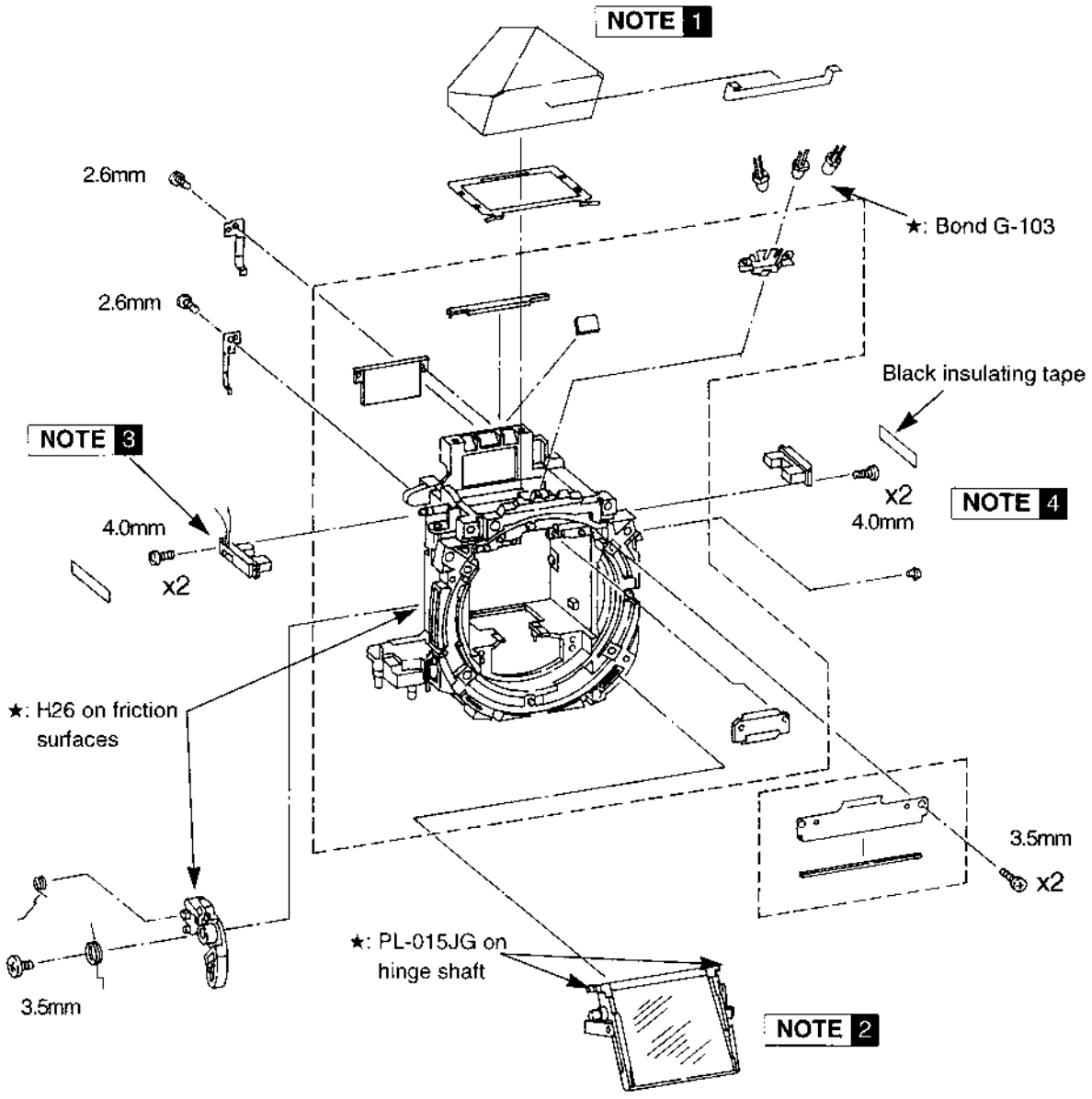


Fig. 3-26 Mirror Box - 2

ASSEMBLY & DISASSEMBLY NOTES

NOTE 1 : Pentaprism Installation

- After installing the pentaprism, seal it with Silicone KE375B as shown in figure 3-27.

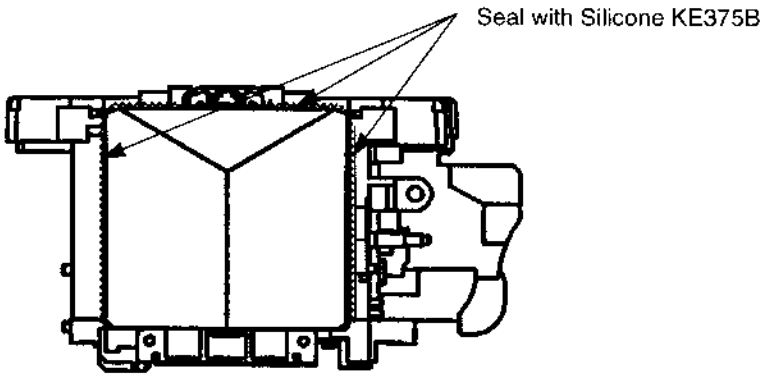


Fig. 3-27 Pentaprism Sealing

NOTE 2 : Mirror Unit

If the mirror unit is replaced, the sub-mirror adjustment is necessary. See the mechanical adjustments for the procedure.

NOTE 3 : Panorama LED Unit (EOS 55 only)

The Panorama LED Unit is used in the EOS 55 only, but the right LED unit's LED holder is installed on the mirror box as shown in figure 3-26. (This part is not stocked.)

NOTE 4 : Insulating Tape Attachment

Cover the right LED unit's LED holder with tape cut to the dimensions shown. (Fig. 3-26).

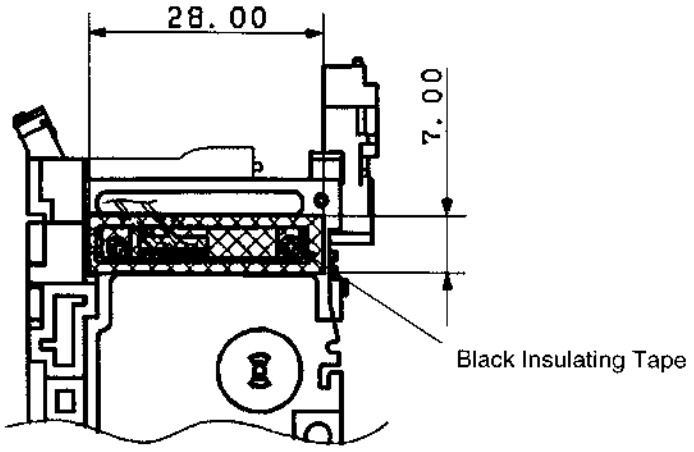


Fig. 3-28 Tape Installation

2.6 BODY DISASSEMBLY -1

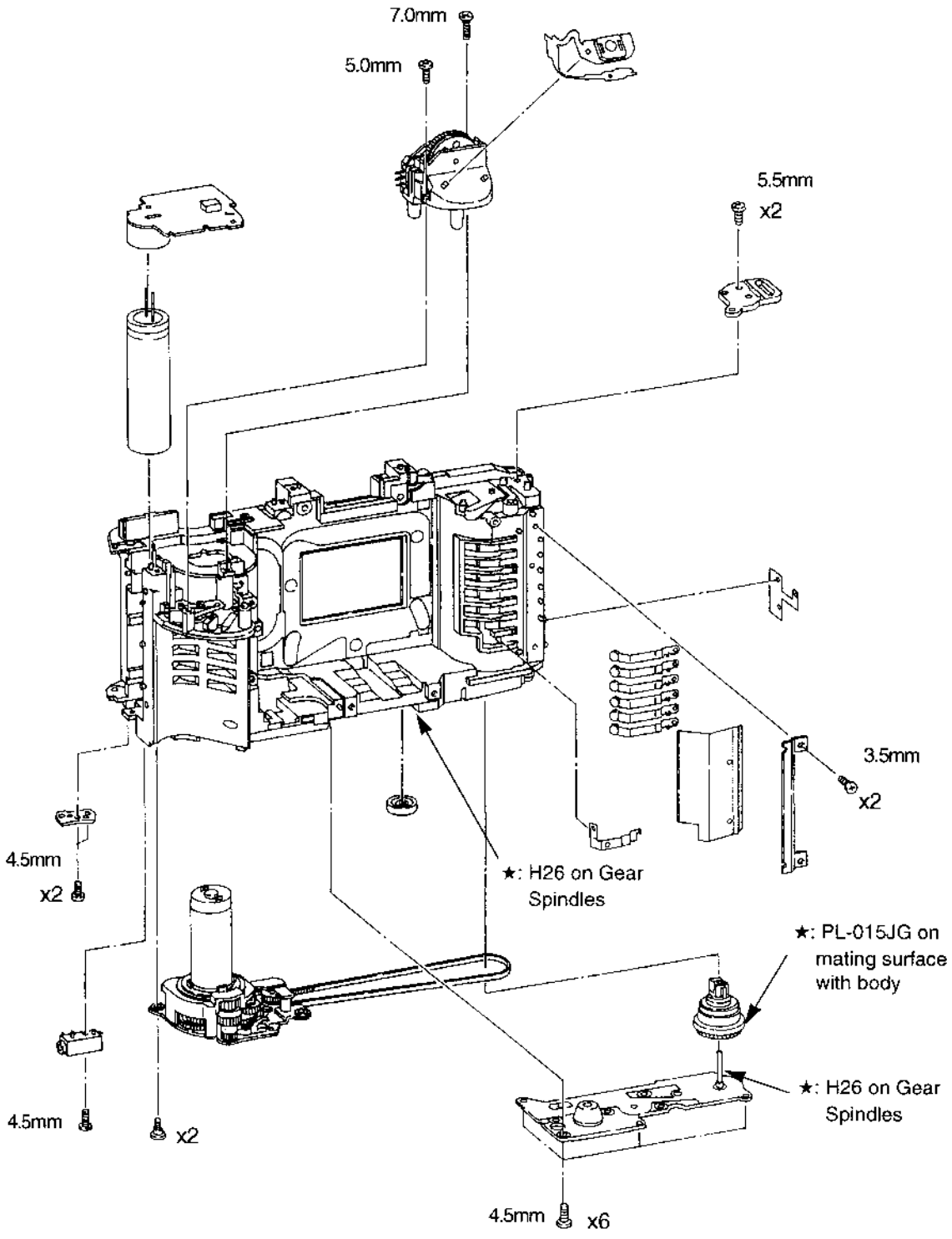


Fig. 3-29 Body - 1

2.7 TRANSPORT UNIT DISASSEMBLY

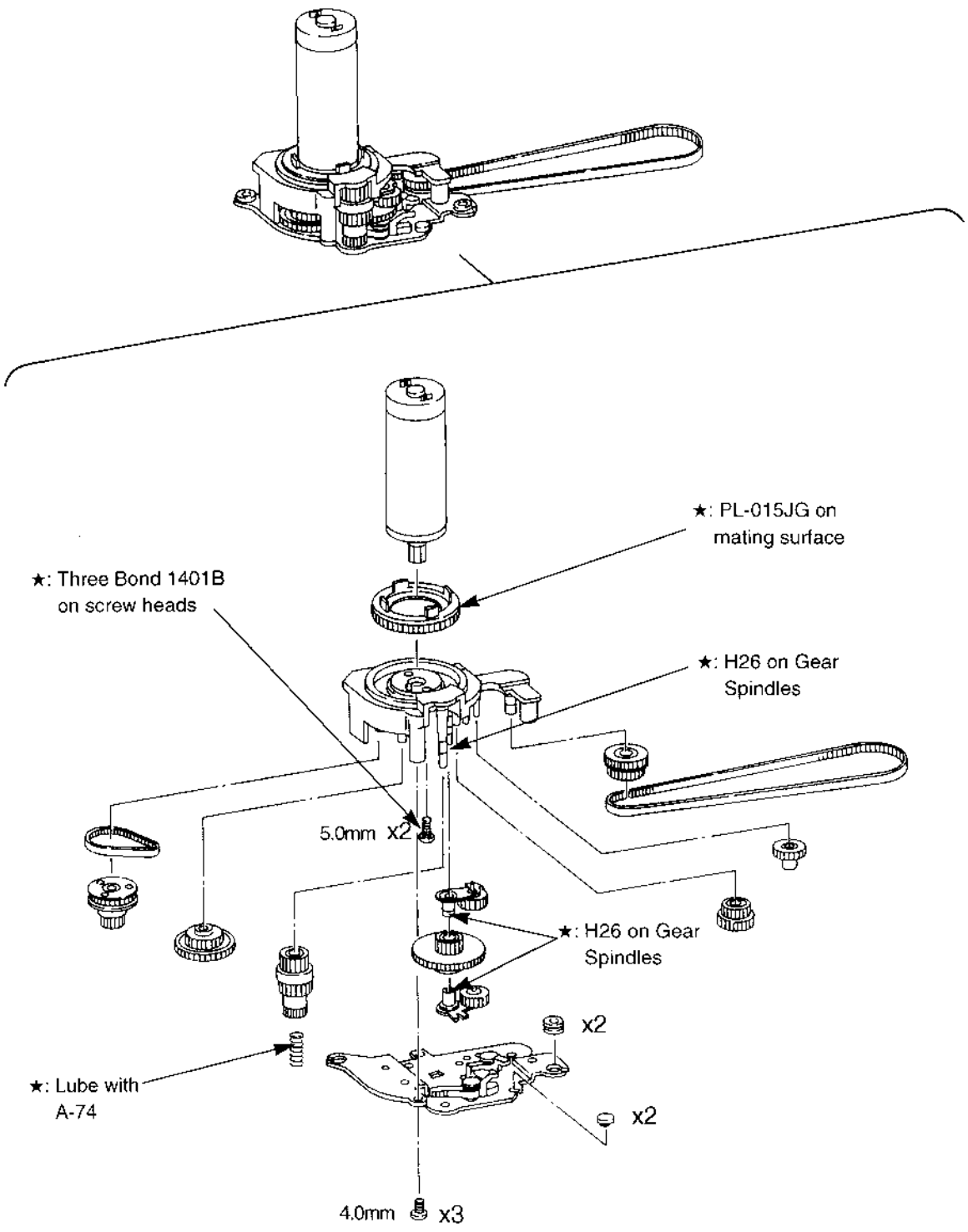


Fig. 3-30 Transport Unit

2.8 BODY DISASSEMBLY -2

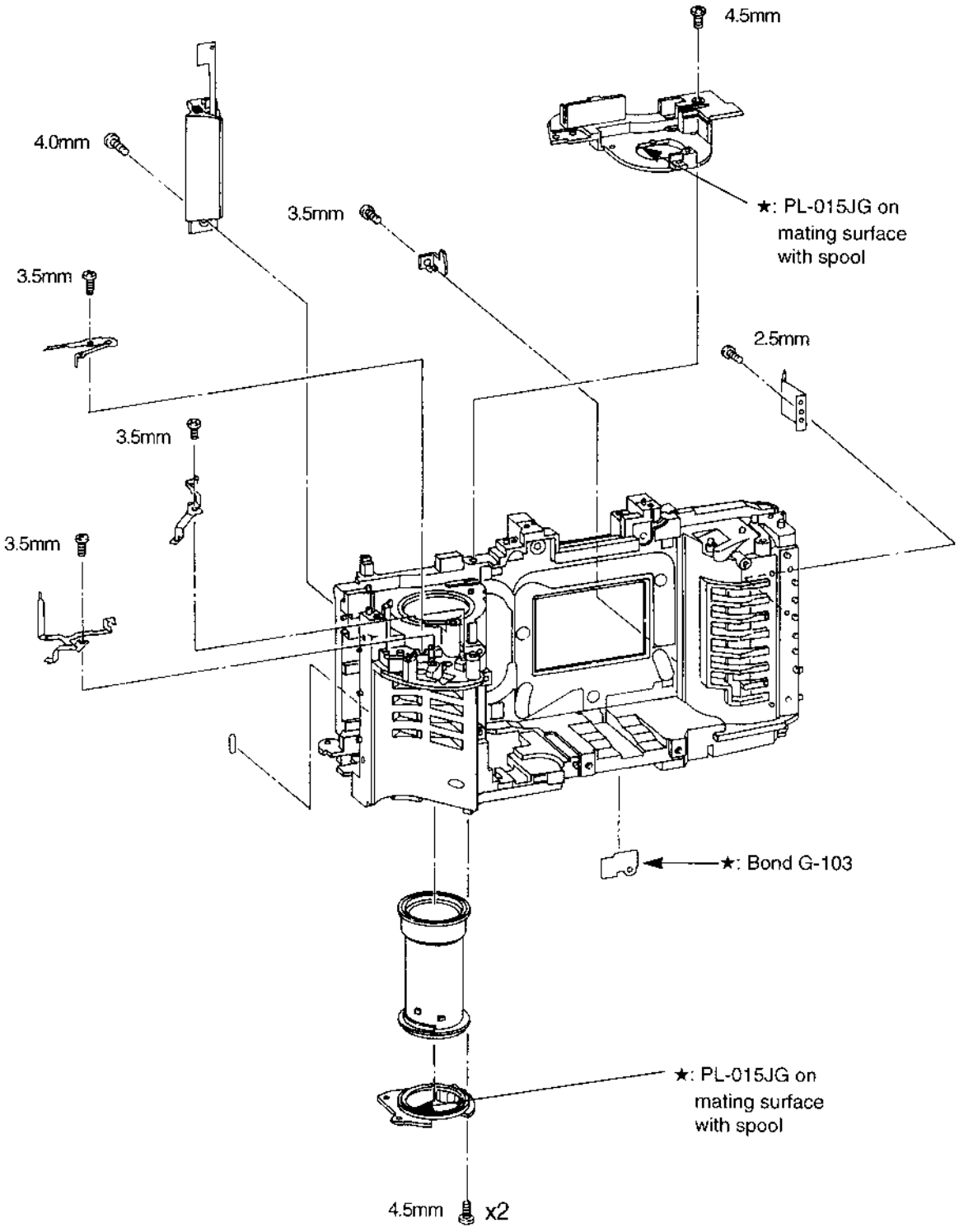


Fig. 3-31 Body - 2

2.9 Back Cover Unit Disassembly

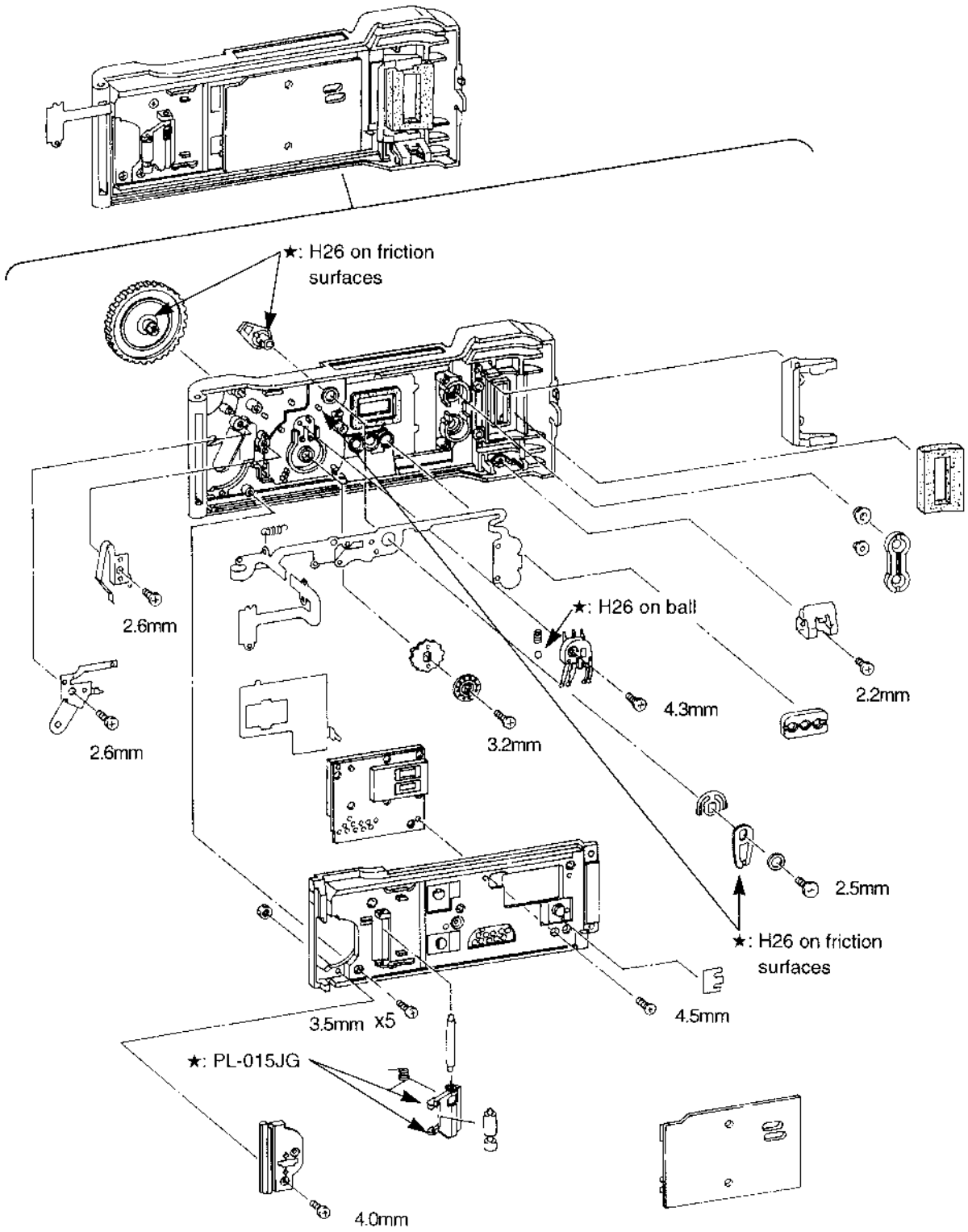


Fig. 3-32 Back Cover Unit

2.10 Top Cover Disassembly-1

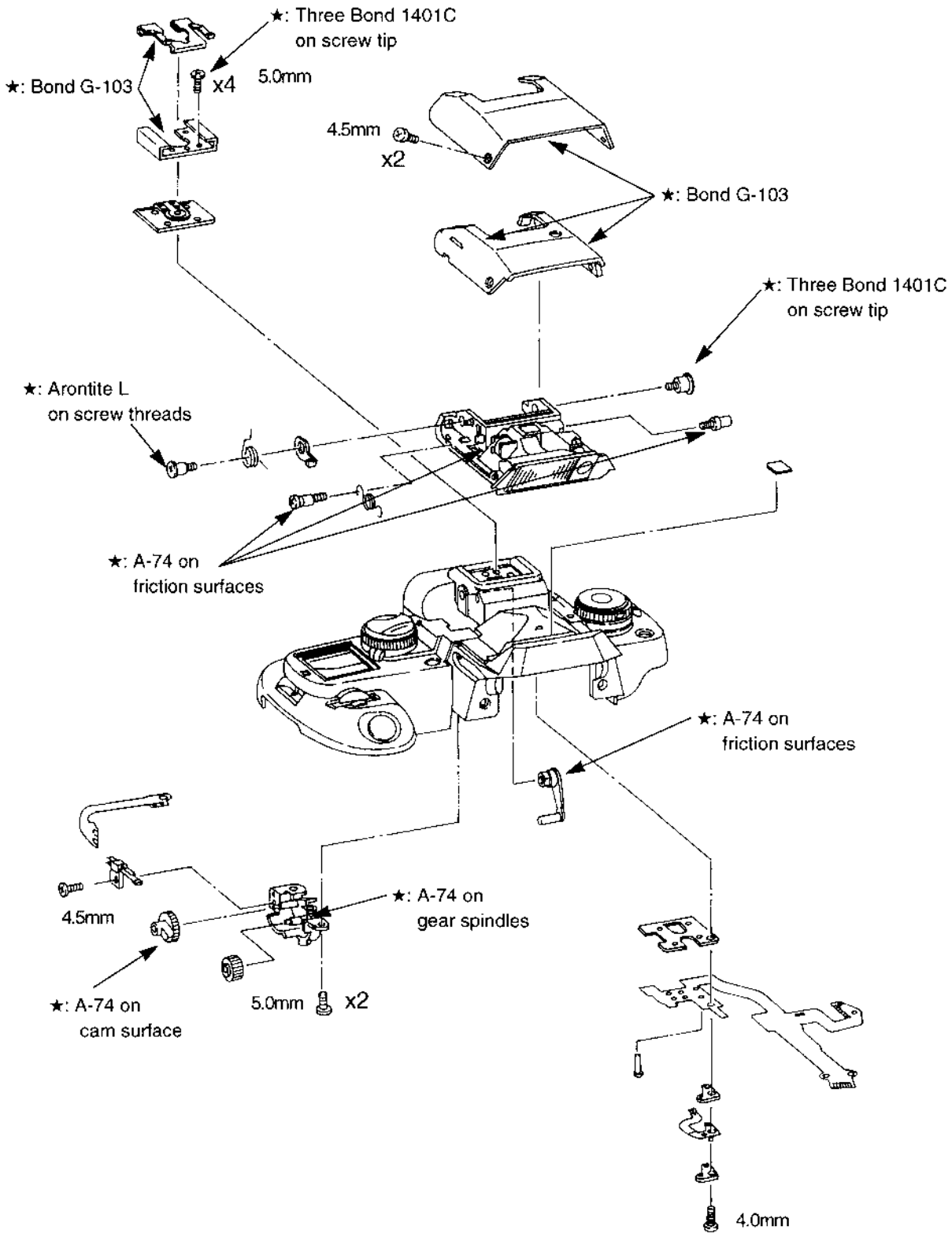


Fig. 3-33 Top Cover - 1

2.11 Top Cover Disassembly-2

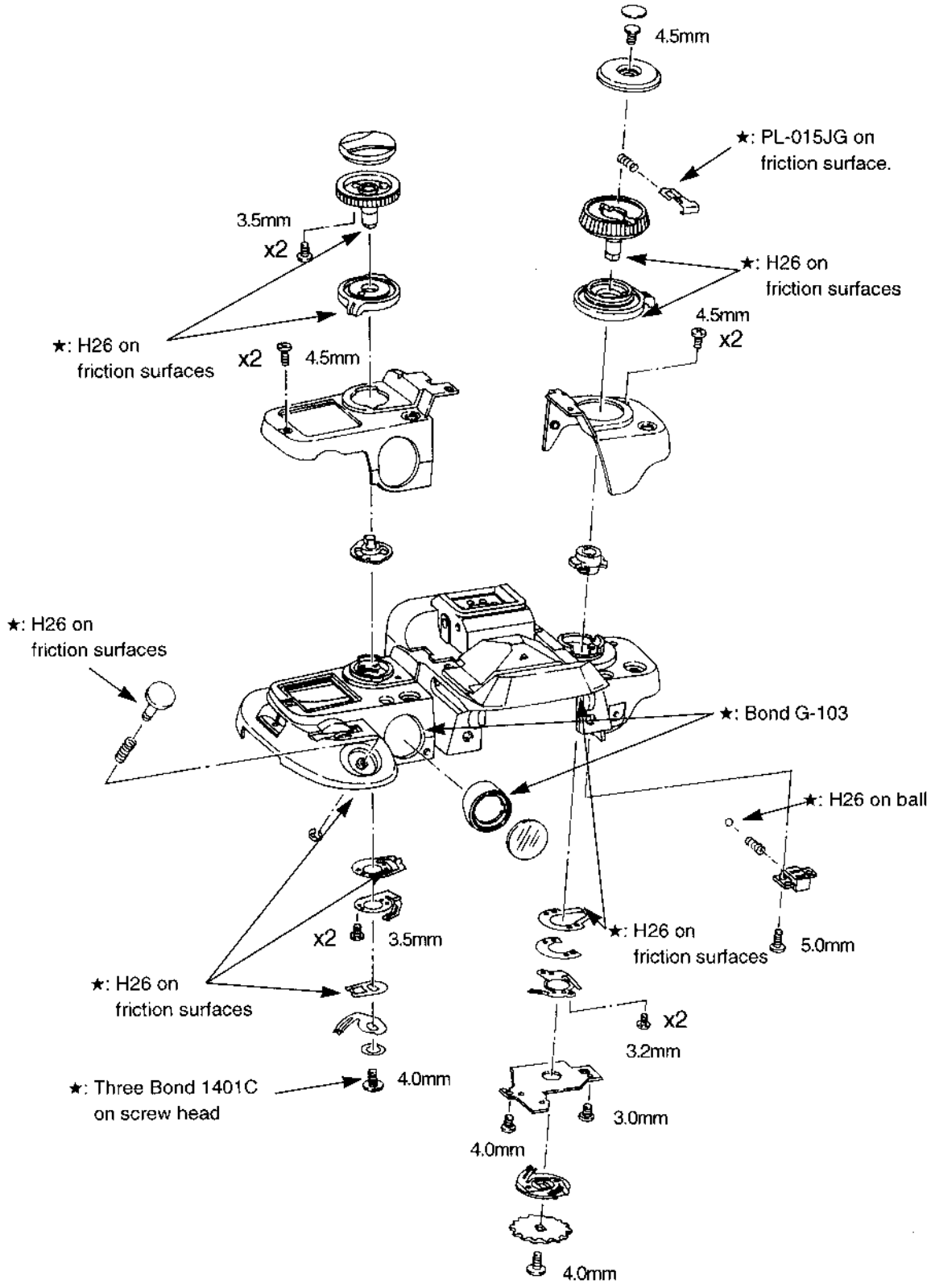


Fig. 3-34 Top Cover - 2

3. MECHANICAL ADJUSTMENTS

3.1 SUB-MIRROR 42° ANGLE ADJUSTMENT

CAUTION: The sub-mirror angle must be adjusted when the front panel unit or mirror unit is disassembled or replaced. The main mirror angle is not adjustable.

PURPOSE:

To adjust the sub-mirror vertically to obtain the mirror angle (42°). (Horizontal alignment is checked only.)

STANDARD:

Vertical	42° ± 5'
Horizontal	0° ± 8'

TOOLS:

Universal 90° Collimator-3; Hex key (0.05" or about 1.2mm); Sub-mirror gage (42°)

PREPARATION:

Attach the sub-mirror gage (42°) to the universal 90° Collimator-3 to calibrate the sub-mirror magnifier. (Refer to the Universal 90° Collimator Operating Instructions for details on calibration.)

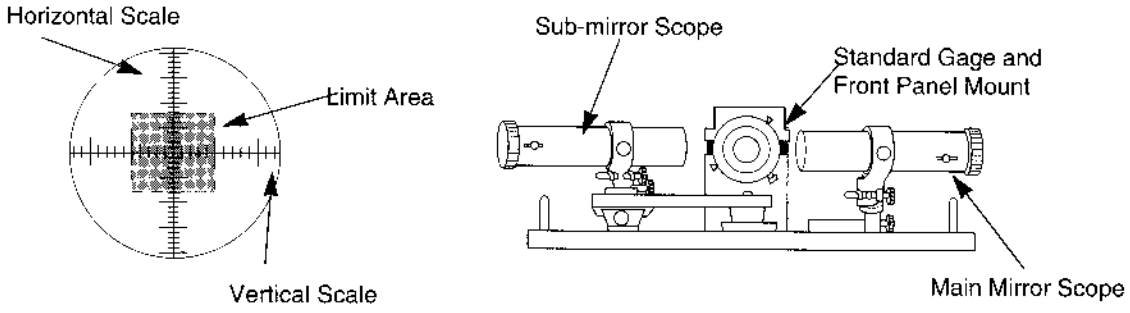


Fig. 3-35 Universal 90° Collimator

ADJUSTMENT:

1. Unhook the mirror up spring and put the mirror down.
2. Attach the front panel unit to be tested with the mirror unit and no AF sensor unit to the universal 90° Collimator-3.
3. Use the hex key to turn the eccentric dowel in the mirror box, as shown in the below illustration to adjust the vertical angle..

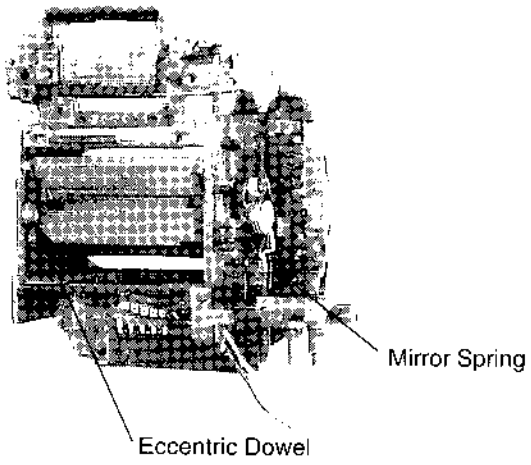


Fig. 3-36 Sub-mirror Adjustment

3.2 AF Sensor Positioning (Horizontal)

CAUTION: The AF sensor position must be adjusted when the AF sensor unit is replaced. Adjustment is basically similar to the previous EOS cameras.

Purpose:

To align the center position of the AF sensor with the optical axis. (Horizontal adjustment only.)

Standard

The center of the sensor must be inside the central AF frame.

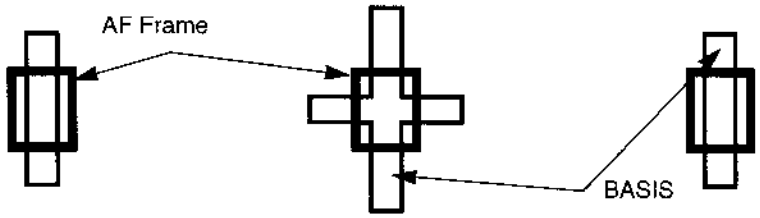


Fig. 3-37 AF Frame and BASIS Alignment

Tools:

EF50mm *f*/1.8 (product) Pen light or illuminator

Preparations

1. Use the body of the EOS camera to stop down the EF50mm *f*/1.8 lens to *f*/8.
   - When EOS 1000 is used, mount an EF50mm *f*/1.8 and set AV mode and the aperture to *f*/8. Shade the lens to cause a long shutter speed. Press the shutter button and remove the lens while the shutter is open. Remove the lens while holding SW2 on.(For other camera types, refer to earlier Service Manuals.)
2. Set the distance scale of the lens to infinity(to make the AF frame clear).

Adjustment:

1. Install EF50mm *f*/1.8 to the front panel with the mirror unit, focusing screen, and the main flex with the AF sensor unit installed temporarily
2. Illuminating the AF sensor unit with a penlight, look in the lens and check the AF frame and a BASIS image as shown below.
3. Move the AF sensor unit vertically to adjust the position of the sensor to the center of the AF frame.
4. Slightly tighten the screws in the AF sensor unit and apply Three Bond 1401B to the head of the screws.

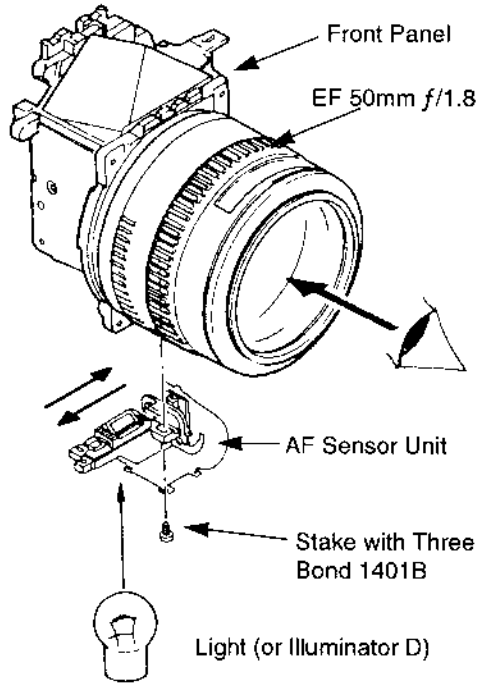


Fig. 3-38 AF Sensor Positioning

3.3 Flange to Focal Plane Distance Adjustment

CAUTION The Flange to Focal Plane distance (FFD) must be adjusted when the front panel unit or mount has been replaced. Before making the adjustment place the focusing rail optical flat on the rails to check for gross misalignment. After adjustment, check the viewfinder focus.

Purpose:

Adjust the FFD to 44.14mm (with focusing rail optical flat on outer rails).

Standard:

FFD	44.14 ± 0.05mm (center of optical flat).
Parallelism:	0.03mm or better (difference in four corners)
Pressure plate center	44.17 ± 0.05mm

(Use this data on the pressure plate center for electric adjustment AF Standard adjustment.
Pressure Plate Center Depression: 0.030 +/- 0.020mm using outer rail reference).
*: Pressure Plate Center Depression is measured at the "E" point.
*: E should be lower (more +) than any of ABCD, but one of the four points can be as much as +15um,and one more can be +5um compared to E.

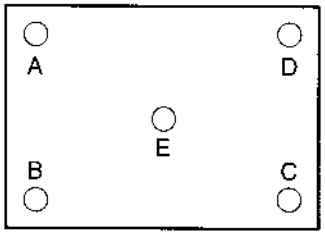


Fig. 3-39 Pressure Plate Points

Tools:

Dial gage / Auxiliary ring (2mm) / Optical flat / Flange gage (44.14mm or 42.14mm)

Preparations:

1) Insert the auxiliary ring (2 mm) between the leg of the dial gage and the point.
   - This is because the dial gage was designed for the FD lens (42.14mm) standard.
2) Use the flange gage (44.14mm or 42.14mm) and optical flat to adjust the dial gage to zero.

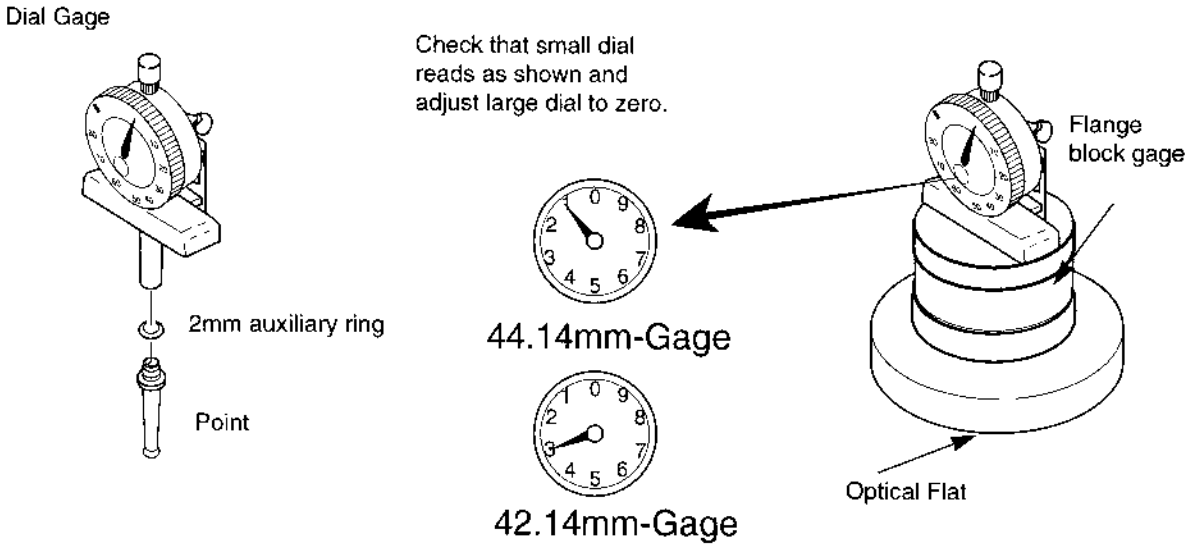


Fig. 3-40 Dial Gage

ADJUSTMENT:

1. Flange Back
   1) Open the back cover and set the focusing rails on the focusing rail flat. Set the camera to bulb in the manual mode, open the shutter and hold SW2 down during adjustment.
   2) Place the dial gage on the mount and measure the FFD at A,B,C,D, and E.
   3) If it is out of limit, change the mount spacer.
   4) Measure the four corners of the pressure plate to check parallelism. If it is out of limit, change the parallelism adjustment washers as necessary.
2. Pressure Plate Center
   1) Close the back cover, and open the shutter.
   2) Place the dial gage on the mount and measure the FFD to the pressure plate center (E.).
   3) If it is out of limit, change the pressure plate.
3. Pressure Plate Center Depression
   - From the results of 1. and 2., figure the pressure plate center depression, and if it is out of limit, change the pressure plate.

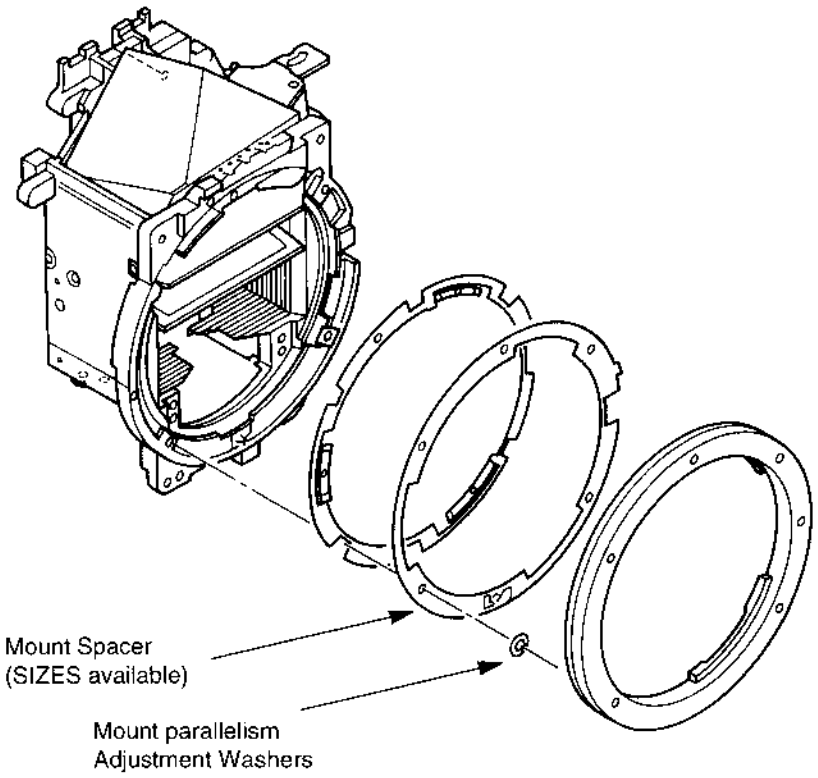


Fig. 3-41 Flange Back Adjustment

3.4 VIEWFINDER FOCUS ADJUSTMENT

CAUTION Be sure to adjust the viewfinder focus after the FFD adjustment.

PURPOSE:

To match the viewfinder focus with the film focus position.

STANDARD:

The finder should be sharpest within 1.5 index line widths, as shown in figure 3-42.

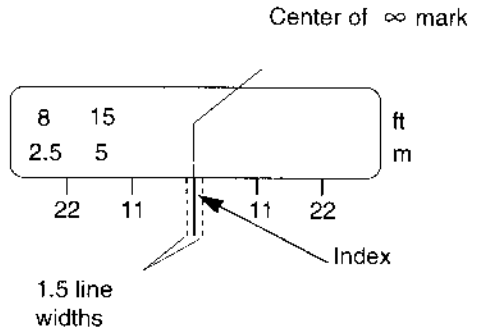


Fig. 3-42 Lens Focusing Scale and Index

TOOLS:

AD-S magnifier / EF50mm *f*/1.8 / Universal 500 mm collimator

ADJUSTMENT:

1) Install the magnifier on the eyepiece and adjust it to your eyesight. (The lens should not be installed at this point.)

   Eyesight adjustment procedure
   Aim the camera at a bright source EV 12 or over (white wall or light source of shutter tester), and turn the eyesight adjustment ring of the magnifier until the focusing frame is as sharp as possible.

2) Install an EF50mm *f*/1.8 to set the focusing scale to manual.

3) Find a distant target at least 250 meters away (lighting rod or chimney if possible) and select the sharpest focus washer.

4) If the collimator is used, select a focus washer in which the sharpest scale of the collimator can be seen.

FOCUS WASHER REPLACEMENT

Place tweezers in the holes in the focusing screen holder and pull it out. The screen and washer will come with it. The holder my be permanently deformed if too much pressure is used.

CAUTION

Do not scratch the focusing screen.

- Make sure the focusing screen, focus washers, and holder are all squarely in place and installed in the correct direction.

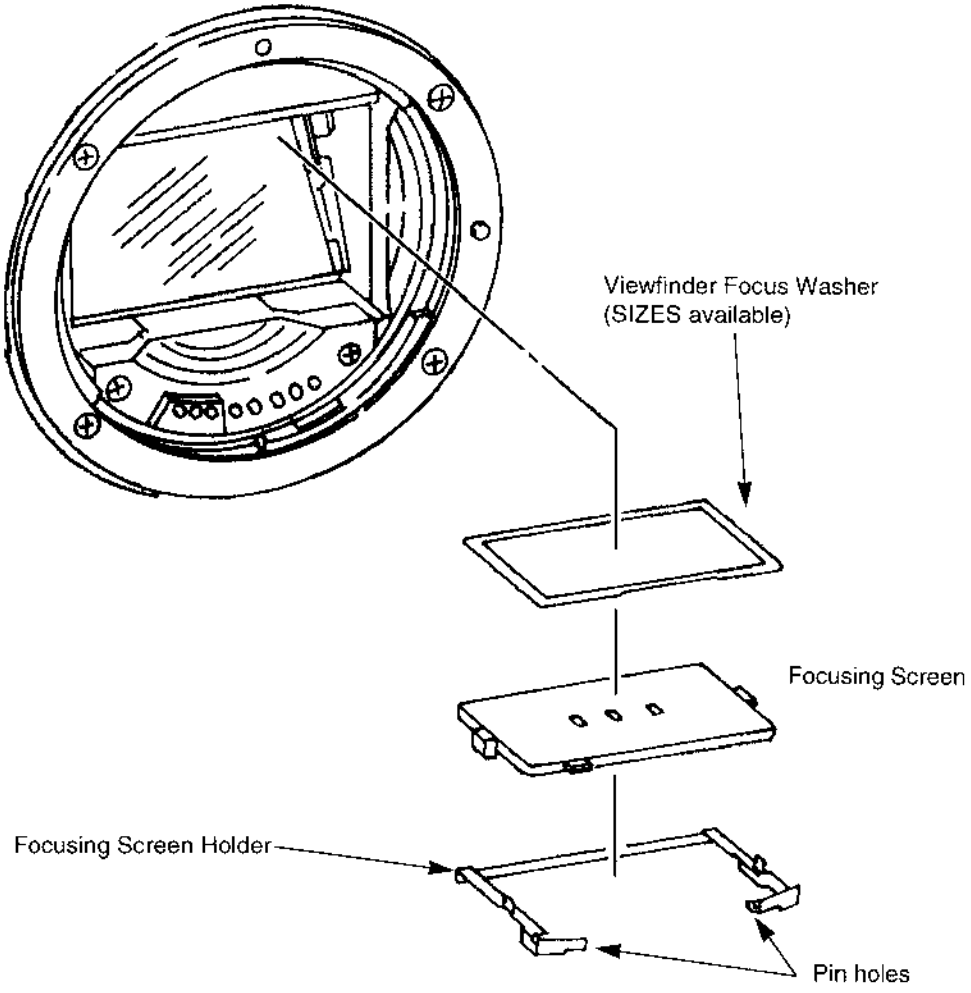


Fig. 3-43 Finder Focus Washer

<MEMO>

4. ELECTRICAL ADJUSTMENTS

4.1 INTRODUCTION

Shutter adjustment:	Adjusting shutter speeds.
SPD positioning:	Positioning IC1 (AE IC).
AE accuracy adjustment:	Adjusting data output of IC1 (AE IC).
AE shift:	Shifting automatic exposure level at user request.
AF basic adjustment:	Adjusting data output of BASIS.
AF focus adjustment:	Adjusting focus data from data output of BASIS.
Sensor data output:	Displays data output from BASIS to check AF accuracy.
Focus data output:	Displays focus data to check AF accuracy.
AF focus shift:	Correcting rare slight AF focus errors resulting from use of a lens with shallow depth of focus (EF50mm *f*/1.0L, EF 85mm *f*/1.2L, or EF 135mm *f*/2.8SF).
Flash adjustment:	Adjusting the data output of the flash sensor.
Inhibit voltage adjustment:	Adjusting inhibit voltage for the camera.
ECF Adjustment	Adjusting the Eye-controlled Focus (ECF)
Self check:	Checking the switches and LCDs.
Data transfer:	Initializing, storing, or transferring camera data, and resetting counter when necessary..
Temperature correction:	Correcting data output of the temperature sensor.

4.2 ADJUSTMENTS AFTER PARTS REPLACEMENT

Table 3-2 ADJUSTMENTS after PARTS REPLACEMENT

Adjustment / Replaced Parts	Initial-ization	Temperature correction	Inhibit voltage	Shutter	AE			AF			Flash OTF	ECF
					SPD	Accuracy	Shift	Accuracy	Focus	Focus shift		
AE					①	②	▲					
Main flex (Data not readable)	①	②	③	④	⑤	⑥	▲	⑦	⑧		⑨	⑩
Main flex (Data readable)		①	②		③	④					⑤	
AF unit								①	②			
Shutter unit				①								
Mirror Unit								①	②			
ECF Eyepiece Unit												①

NOTES:
- The numbers indicate the order of adjustment.
- The items marked ▲ in the above table are optional.
- Inhibit voltage and temperature compensation adjustments must be performed immediately after initialization.

4.3 ADJUSTMENT SOFTWARE FOR THIS CAMERA

1. Adjustment Software Loading

The file name of this software is EOS50.BAT. After a work disk is made the software will run automatically by the AUTOEXE.EXE file

2. Adjustment Software Operation

This software only requires operation of the RETURN (ENTER) key, SPACE Bar and Cursor keys. Follow the instructions on the screen to adjust the camera.

3. Connecting the Camera to the Computer

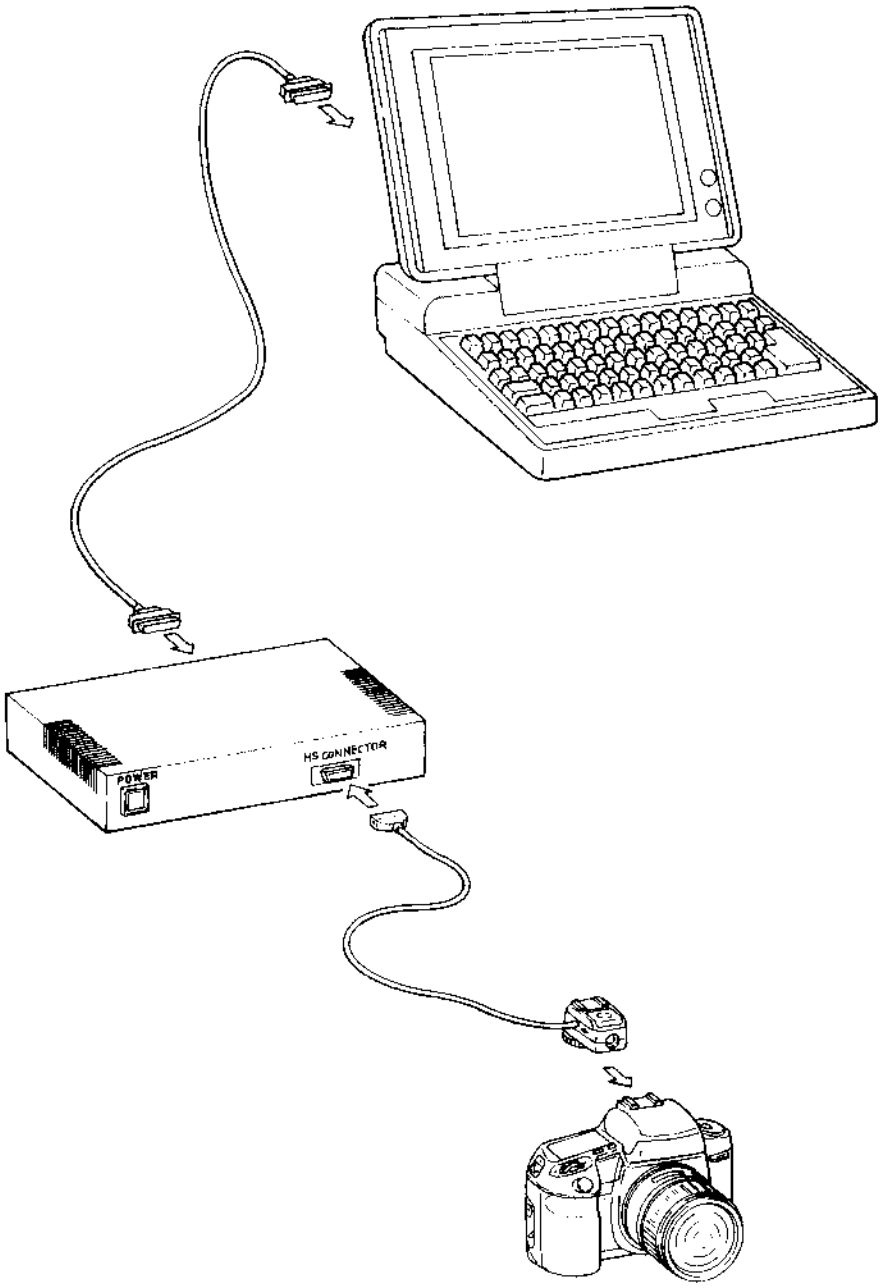
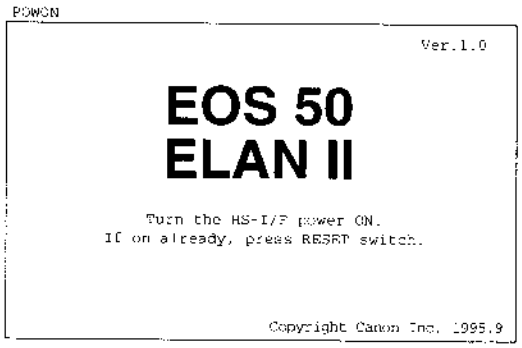


Fig. 3-44 Camera Connection

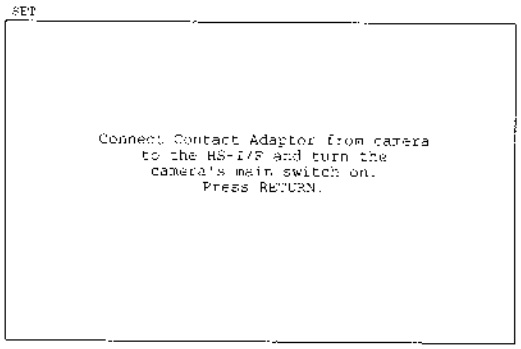
4. Adjustment Start-up Procedures

Load the work disk in the computer then turn it on. After a while, the title screen appears as shown at the right.

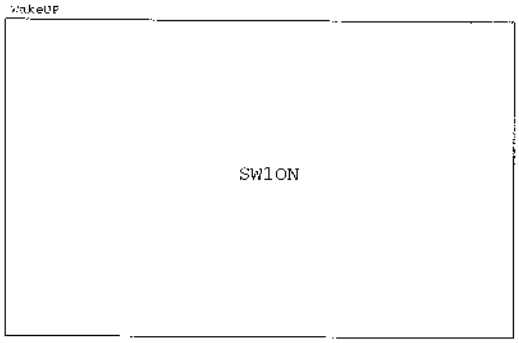


Turn on the HS-I/F in accordance with the directions displayed on the screen. If HS-I/F has already been turned on, turn it off once and then turn it on.

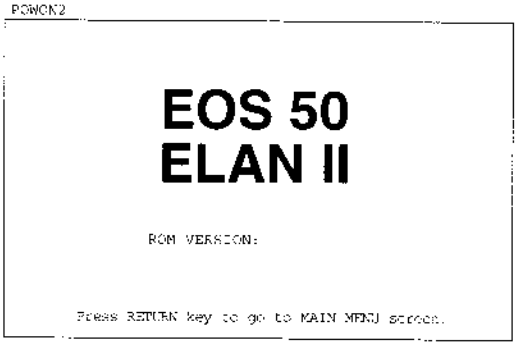
Upon establishment of communications between the computer and HS-I/F, the screen shown at the right appears. Connect the camera to HS-I/F as indicated and turn on the main switch on the camera. After communications are established, press the Return key.



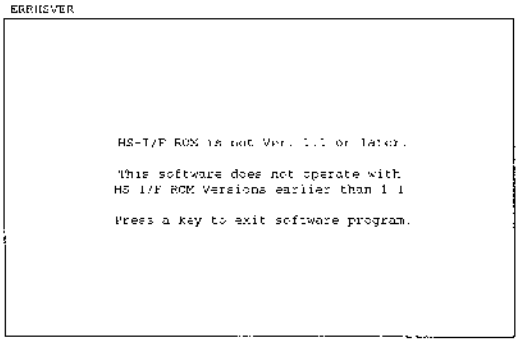
At times it is necessary to switch the camera's SW1 on to establish communications. Follow the screen instructions. If more than a minute passes before SW1 is pressed, an error will occur.



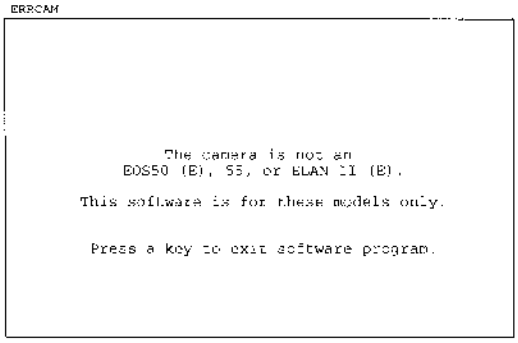
Upon establishment of communications between the computer and the camera, The camera ROM version number and number of releases.

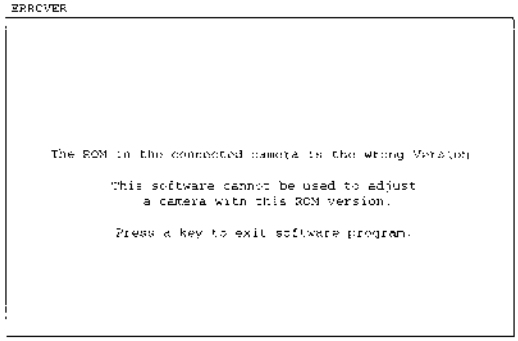


This camera requires an HS-I/F with uprated Ver. 1.1 ROM for adjustments. If the HS-I/F does not have Ver. 1.1 ROM, this message will appear.


ERRHSVER
HS-I/F ROM is not Ver. 1.1 or later.
This software does not operate with
HS I/F ROM Versions earlier than 1.1
Press a key to exit software program.

If a camera other than an EOS 50 (E), 55, or ELAN II (E) is attached, this message will appear.


ERRCAM
The camera is not an
EOS50 (E), 55, or ELAN II (E).
This software is for these models only.
Press a key to exit software program.


ERRCVER
The ROM in the connected camera is the wrong Version
This software cannot be used to adjust
a camera with this ROM version.
Press a key to exit software program.

5. Adjustment Items Table

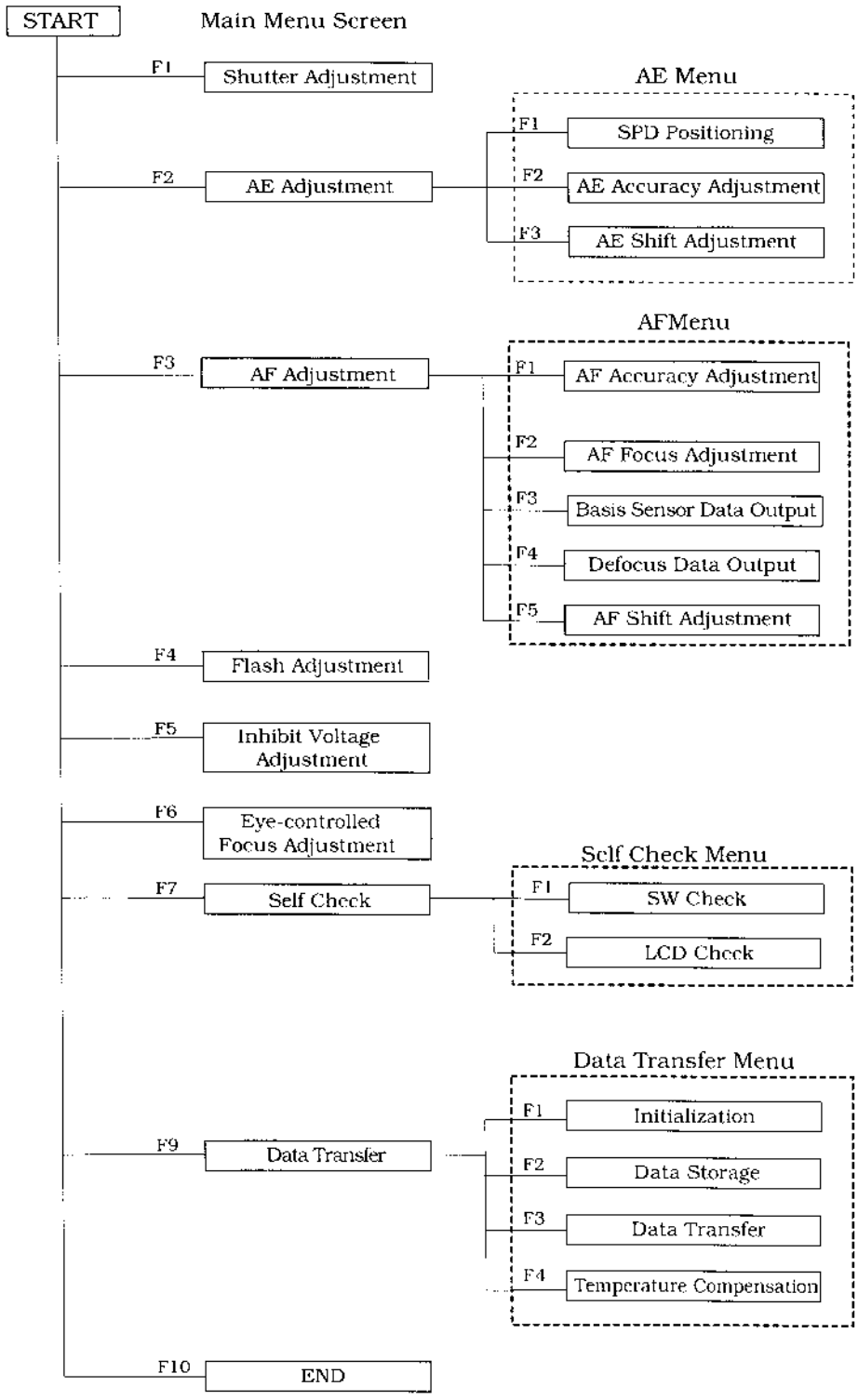


Fig. 3-45 Adjustment Items

4.4 SHUTTER ADJUSTMENT

PURPOSE:

To adjust shutter speeds. If the maximum shutter speed (1/4000sec) is within the limits all shutter speeds have been adjusted.

STANDARD:

Shutter speed standard

Marked shutter speed:	1/4000
Exposure time:	0.290ms
Limits:	0191 - 0.440ms

CAUTION Check that the shutter curtain travel times conforms to the standard. If not,adjust the 2nd curtain travel time.If the 1st curtain is not within limits, replace the shutter unit.

Shutter curtain travel time standard

First curtain travel time:	4.8 ± 0.2ms
Second curtain travel time:	4.8 ± 0.2ms

TOOLS:

Personal computer RS-232C cable HS-I/F

Adjustment software (stored on a work disk)

EF-8000 EF50mm $f/1.8$ production lens

PREPARATION:

1) Start adjustment program, connect the camera to the computer through the HS-I/F , and select (F1) Shutter Adjustment on the menu screen.
2) Attach the EF50mm $f/1.8$ production lens to the camera, set TV and AV to 4000 and $f/1.8$ respectively in the manual mode, and set the camera on the EF-8000. Set the EF-8000 to shutter speed mode.

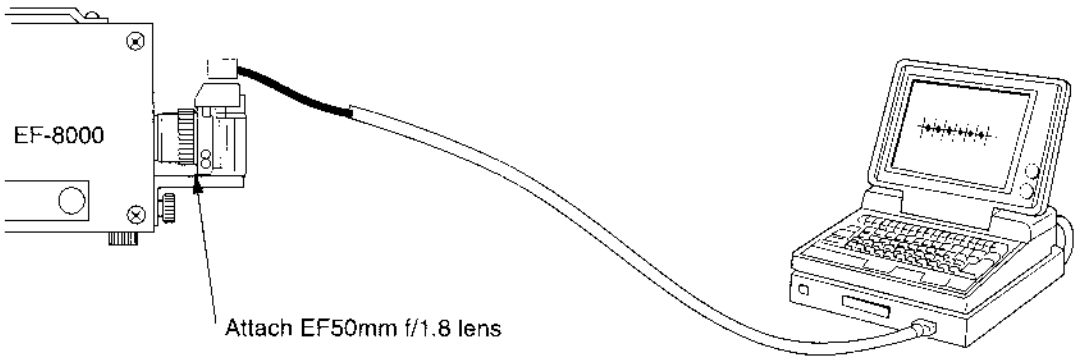
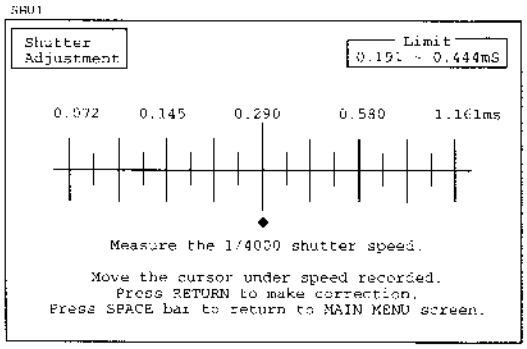


Fig. 3-46 Shutter Speed Adjustment

ADJUSTMENT:

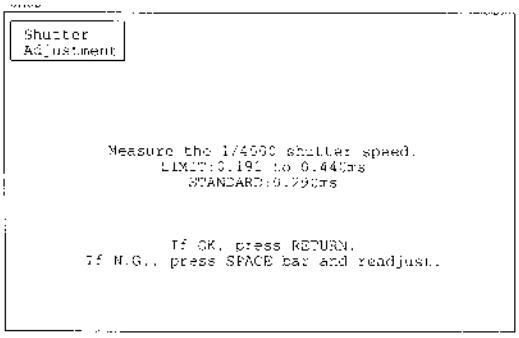
1) Measure the shutter speed and press the cursor keys to move the cursor to enter the measured value.

   Press the Return key and then SW1 on the camera to establish communications between the two to change camera data.



2) After completion of the communications, measure the shutter speed again to check whether it conforms to the standard.

   If not, press the Space bar and return to step 1).



4.5 X Time Lag Check

Tool:

EF-8000

Standard:

Shutter speed:	1/125
Line A:	0.285ms or more
Line B:	1.70ms or more

Adjustment:

1) Set a shutter flash speed of 1/125 in the TV mode or manual mode.
2) Mount a compatible flash or a hot shoe unit (CG9-3194-000) with a 4.7K ohm resistor from the CCC terminal to ground.
3) Test with EF-8000 in DELAY mode, and checks lines A and B.

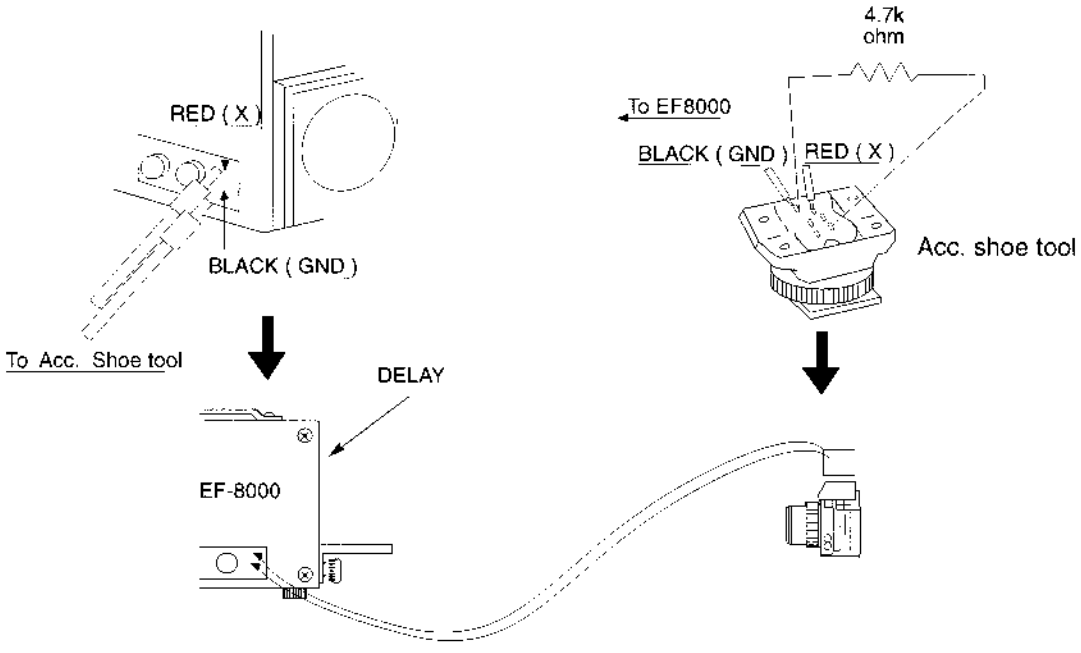


Fig. 3-47 X Time Lag Check

<MEMO>

4.6 SPD Positioning

Purpose:

To align the center of SPD with the optical axis of the camera.

CAUTION Prior to doing this adjustment, do the AE Accuracy Adjustment (F2 on the AE Menu). After finishing this adjustment. Repeat the AE Accuracy Adjustment

Tools:

Personal computer	RS-232C cable	HS-I/F
Adjustment software (stored on a work disk)		
EF-8000	EF50mm *f*/1.8 production lens	
Tripod	SPD positioning mask (use EOS 500 / Rebel X mask)	

Preparation:

1) Start adjustment program, connect the camera to the computer through the HS-I/F , and select (F2) AE Adjustment menu screen.
2) Attach the EF50mm *f*/1.8 production lens to the camera and fix the camera on the tripod toward the light source.
3) Attach the SPD positioning mask to the light source of EF-8000 and set the brightness to LV 15.
4) Set the camera 45cm away from the SPD positioning mask and align the center of the SPD positioning mask with that of the center SI focus frame in the finder. Set the lens manually at the closest distance (45cm).

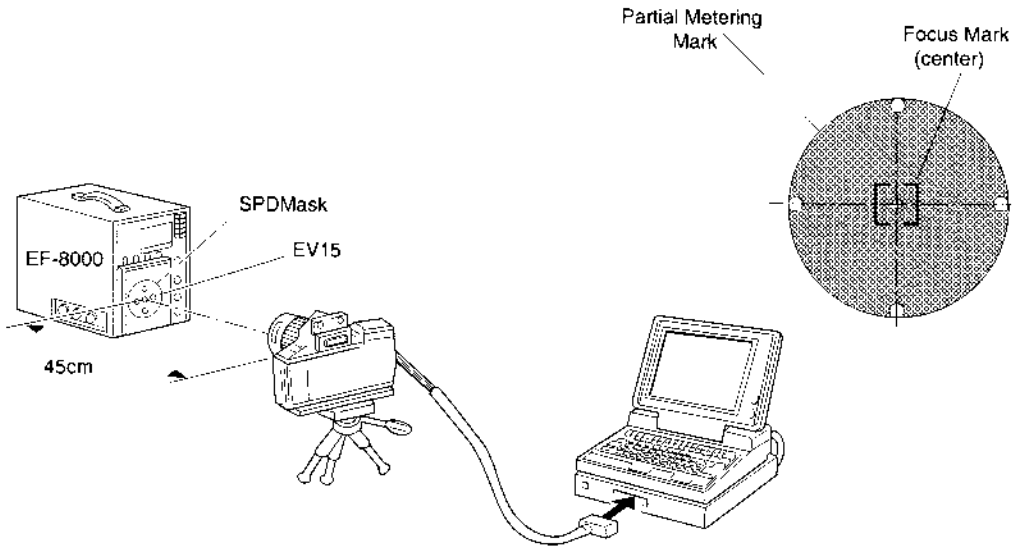


Fig. 3-48 SPC Positioning

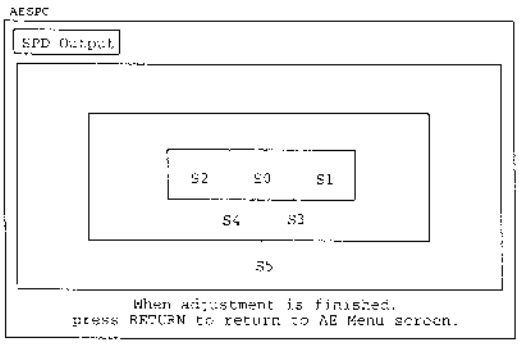
ADJUSTMENT:

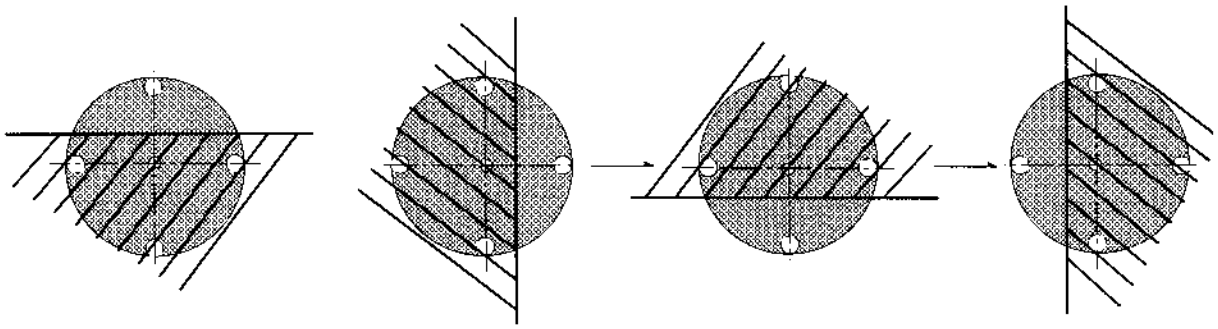
1) Select F1 SPD Positioning on the AE menu screen. The EV values of individual photometric sensors of the SPD will be displayed.

2) Shield four of the five holes as shown below and check the EV value.

3) Position the SPD so that the EV values fall within ± 2 EV.

4) After positioning the SPD, fix the SPD holder with Aron Alpha.





Shield four of the five holes in turn and read the EV of the unshielded hole.

Fig. 3-49 SPC Positioning Check

4.7 AE Accuracy Adjustment

Purpose:

To adjust the output level, and gain, of SPD.

Standard:

Light source	Film Plane Illumination
EV9	0 ± 0.5 EV
EV12	0 ± 0.5 EV
EV15	0 ± 0.5 EV

Tools:

Personal computer
RS-232C cable
HS-I/F
Adjustment software (stored on a work disk)
EF-8000
EF50mm *f*/1.8 production lens

Preparation:

1) Start adjustment program, connect the camera to the computer through the HS-I/F , and select (F2) AE Menu screen.
2) Attach the EF50mm *f*/1.8 production lens to the camera and direct it toward the light source of the EF-8000 with the camera's eyepiece shielded from light so that it will not be affected by external light.

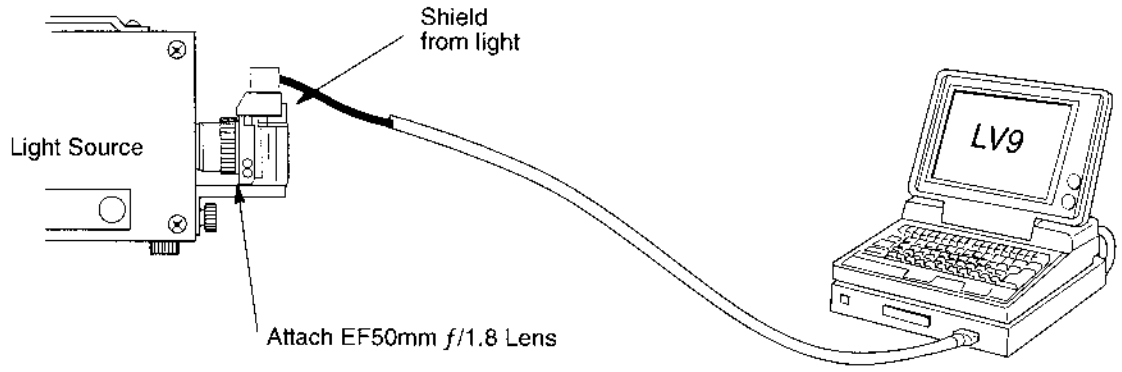
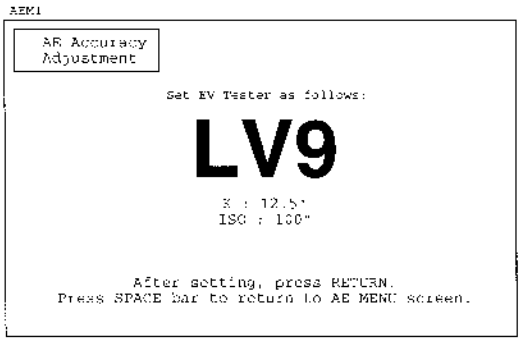


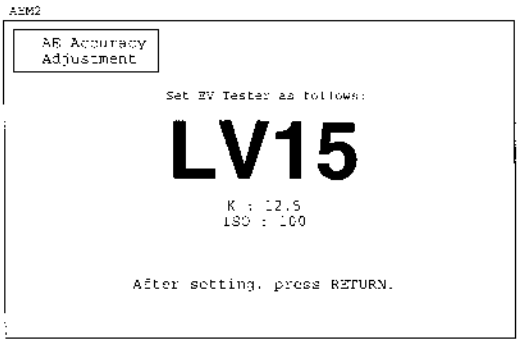
Fig. 3-50 AE Accuracy Adjustment

ADJUSTMENT:

1) Select F2 AE Accuracy Adjustment on the AE menu screen.
2) Expose the camera to a brightness of LV9 and press the Return key.

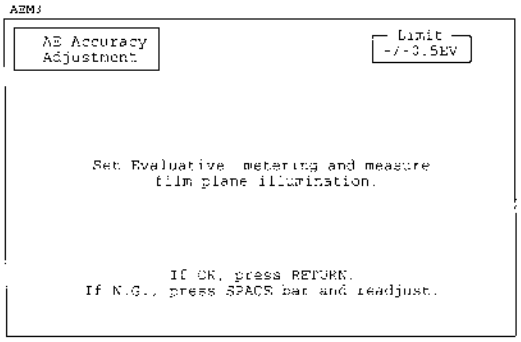


3) Expose the camera to a brightness of LV15 and press the Return key.



4) After completion of the communications, check whether AE accuracy conforms to the standard at LV9, LV12, and LV15 in the AE Program mode with evaluative metering.

   If not, press the Space bar and do the adjustment again.



4.8 AE SHIFT

PURPOSE:

AE shift is intended to shift the center exposure according to the users preference. Whereas AE accuracy adjustment adjusts the output level, and gain, of the SPD, AE shift adjusts only the level. AE accuracy adjustment clears and previously set AE shift.

TOOLS:

Personal computer

RS-232C cable

HS-I/F

Adjustment software (stored on a work disk)

EF-8000

EF50mm *f*/1.8 production lens

PREPARATION:

1) Start adjustment program, connect the camera to the computer through the HS-I/F , and select (F2) AE Menu screen.
2) Attach the EF50mm *f*/1.8 production lens to the camera and direct it toward the light source of the EF-8000 with the camera's eyepiece shielded from light so that it will not be affected by external light.

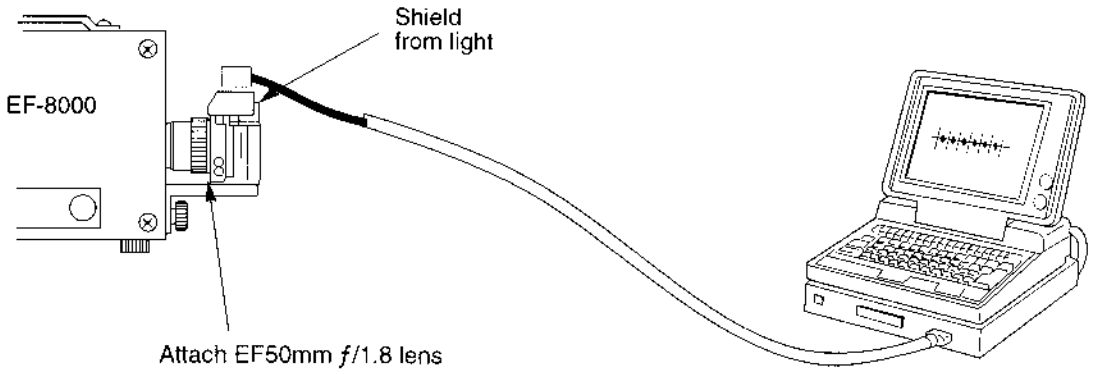
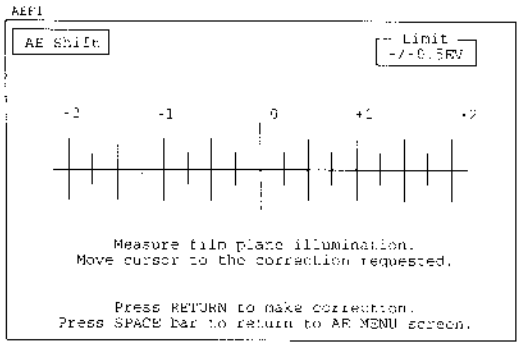


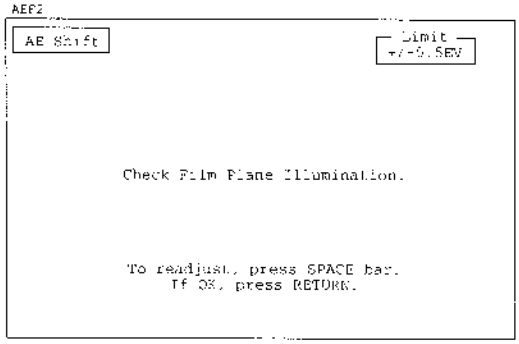
Fig. 3-51 AE Shift

ADJUSTMENT:

1) Select F3 AE Shift on the AE menu screen.
2) Move the cursor to select the desired amount of shift.Exposure can be incremented in about 0.25 stops. For example, to shift exposure by +1 stop, press the cursor keys to move the cursor to the position of +1.



3) After completion of the communications, check exposure at LV9, LV12, and LV15



4.9 AF Accuracy Adjustment

AF Accuracy adjustment must always be made when replacing the AF unit.

AF Accuracy adjustment is necessary if it is impossible to store or transfer camera data before replacing the main flex.Otherwise, this adjustment is unnecessary.

PURPOSE:

AGC adjustment:	Adjusting the gain to insure that the BASIS output waveform is sufficient but does not saturate.
DARK adjustment:	Correcting minute electric current that BASIS (AF sensor) will generate even in the absence of light (dark current).
Shading adjustment:	Compensates for bit-by-bit variations in the sensor output.

CAUTION AF Accuracy adjustment must always be preceded by AF sensor positioning. There must also be no dirt adhering to the main mirror, sub mirror, or light receiving section of the AF sensor.

TOOLS:

Personal computer RS-232C cable HS-I/F

Adjustment software (stored on a work disk)

EF-8000 EF50mm *f*/1.8 production lens

Light Tripod Dark bag

Charts: The EOS5 AGC chart is used

PREPARATION:

1) Set the camera and AGC Chart as indicated.
2) Start adjustment program, connect the camera to the computer through the HS-I/F, and select (F3) AF Menu screen.

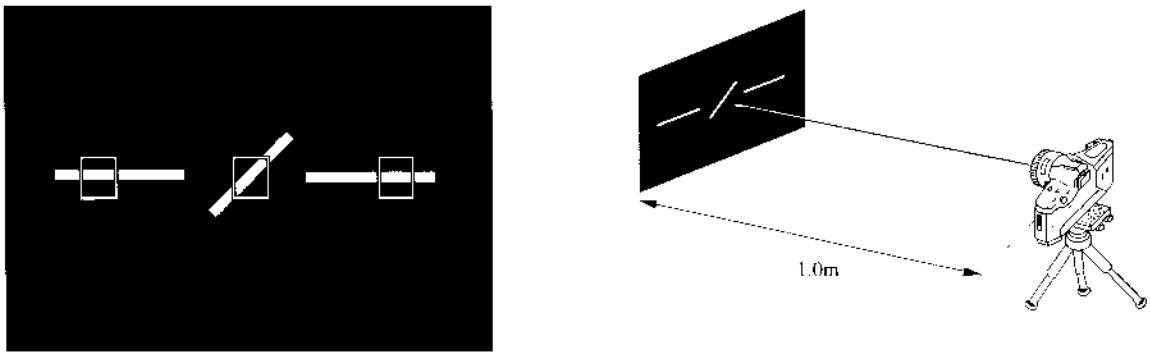
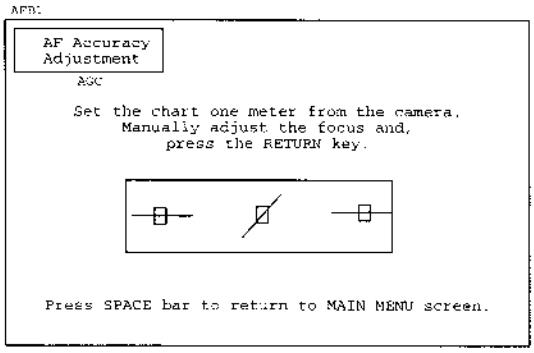
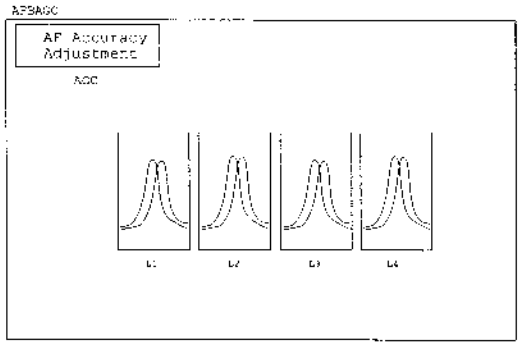


Fig. 3-52 AGC Adjustment

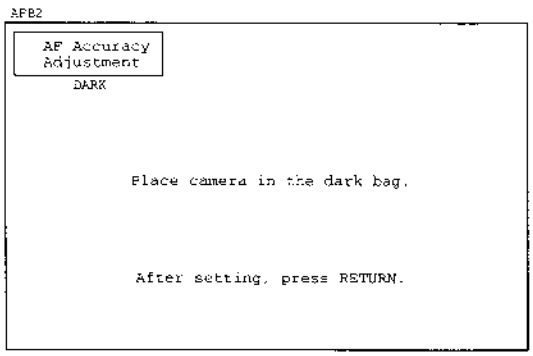
ADJUSTMENT:

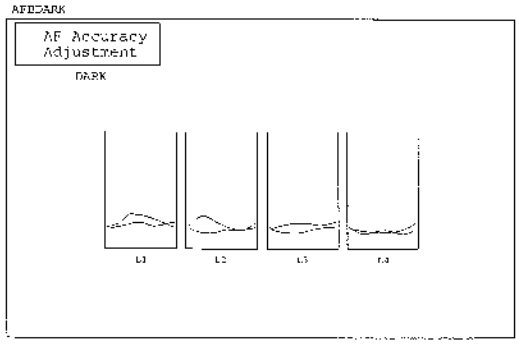
1) Call up the AF Accuracy Adjustment. The screen at the right appears. Insure setting is correct and press Return. The AGC will be adjusted.


AFB1
AF Accuracy Adjustment
AGC
Set the chart one meter from the camera.
Manually adjust the focus and,
press the RETURN key.
Press SPACE bar to return to MAIN MENU screen.



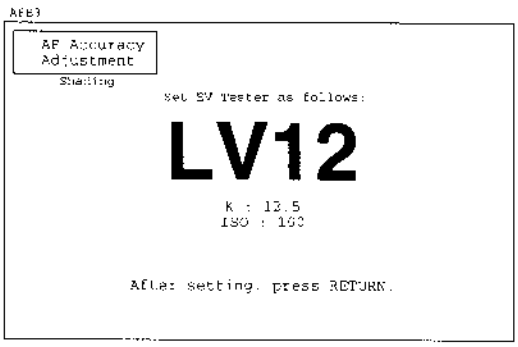
2) When AGC adjustment is complete this screen will appear. Place the camera in a dark bag and press Return.The dark adjustment will be completed.





3) After communications are complete, the screen at the right appears.Place the camera on the light source set to LV12 and press RETURN again.

   This completes this adjustment.The AF MENU screen will reappear.



4.10 AF Focus Adjustment

Purpose:

The purpose of the AF focus adjustment is to match the AF sensor focus with the CCD sensor focus. Unlike film cameras, the flange to focal plane distance (FFD) at the center of the pressure plate is not applicable to this camera.

CAUTION The main mirror, sub mirror, and light receiving section of the AF sensor must be clean when making this adjustment.

Tools:

Personal computer	RS-232C cable	HS-I/F
Adjustment software (stored on a work disk)		
EF-8000	EF50mm *f*/1.8 tool lens	
Light	Tripod	

Preparation:

1) Select the AF Adjustment Menu.
2) Set the camera and chart as indicated for AF Focus adjustment.

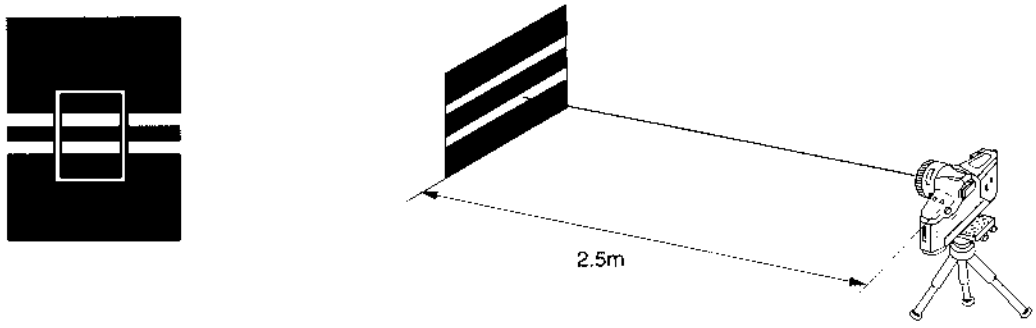
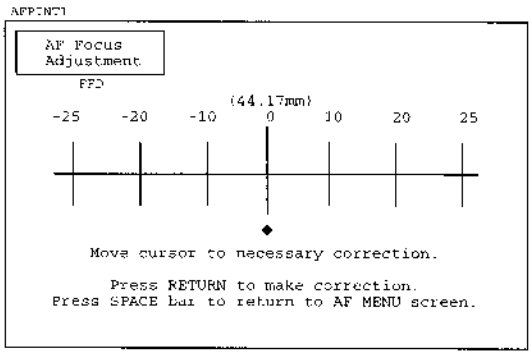


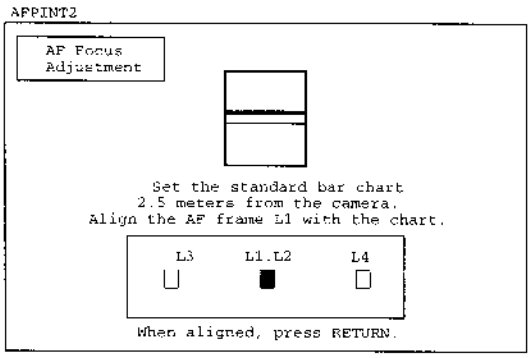
Fig. 3-53 AF Focus Adjustment

ADJUSTMENT:

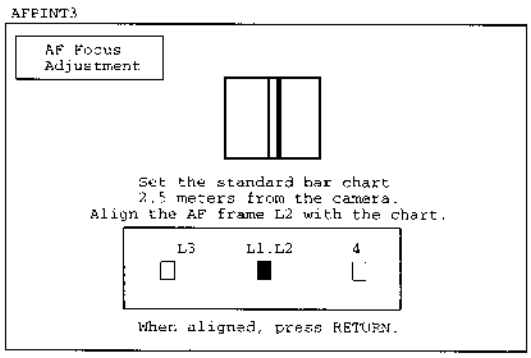
1) Press the Return key to display the screen shown at the right. Input the necessary correction with the cursor keys and press Return.


AFPINT1
AF Focus Adjustment
FFD
(44.17mm)
-25 -20 -10 0 10 20 25
Move cursor to necessary correction.
Press RETURN to make correction.
Press SPACE bar to return to AF MENU screen.

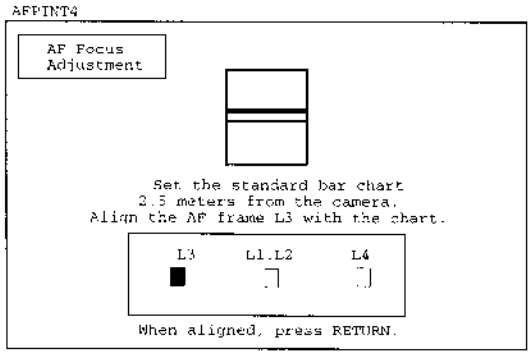
2) When the Return key is pressed, this screen will appear. Place the camera 2.5m ±10mm away from the AF reference chart set with the bar horizontal, set the lens to infinity, and then manually focus it to the scribed 2.5m line. Align the center autofocus frame of the finder with the bars of the AF reference chart and press the Return key.


AFPINT2
AF Focus Adjustment
Set the standard bar chart
2.5 meters from the camera.
Align the AF frame L1 with the chart.
L3 L1.L2 L4
When aligned, press RETURN.

3) Flip the chart 90° as shown in the next screen so the bars are vertical,manually focus it to the scribed 2.5m line. Align the center autofocus frame of the finder with the bars of the AF reference chart and press the Return key.

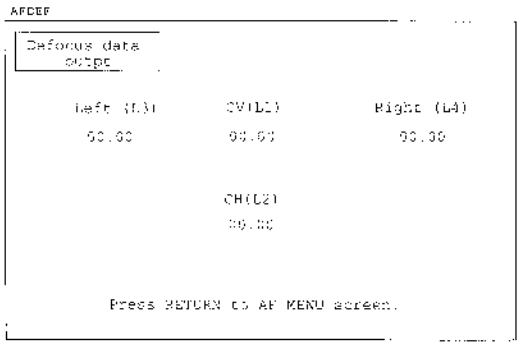

AFPINT3
AF Focus Adjustment
Set the standard bar chart
2.5 meters from the camera.
Align the AF frame L2 with the chart.
L3 L1.L2 4
When aligned, press RETURN.

4) Return the chart to the horizontal and repeat for the other focus areas L3, and L4. When adjustment is complete, return to the AF Menu.


AFPINT4
AF Focus Adjustment
Set the standard bar chart
2.5 meters from the camera.
Align the AF frame L3 with the chart.
L3 L1.L2 L4
When aligned, press RETURN.

When using a tool lens with a focus variation label reading other than 0.00 proceed as follows.

Selcct F4 Defocus Data Output on the AF menu screen to display the screen shown at the right. Turn the focusing ring of the lens from the infinity end while observing the DEFOCUS indication. Stop the focusing ring when the DEFOCUS indication reaches a value which is equal to and which has an opposite sign to the variation marked on the tool lens. (See that GAIN is set to L.)



When the focusing ring is overturned, be sure to set it back to the infinity end and then turn it again.

(Example) When the defocus is +0.03, stop the focusing ring when the DEFOCUS indication reaches -0.03.

5) Press the Return key to return to the AF menu screen.

6) Press the F2 AF Focus Adjustment and repeat steps 1) through 4) to make AF focus adjustment again.

4.11 AF Sensor Dust Check

Purpose:

To check the BASIS data output which can show if the sensor is dirty.

Tools:

Personal computer
RS-232C cable
HS-I/F
Adjustment software (stored on a work disk)
EF-8000

Preparation:

Set the camera at the light source without a lens attached to the camera and the brightness of the light source set to LV12. (Be sure to shield the eyepiece from external light.)

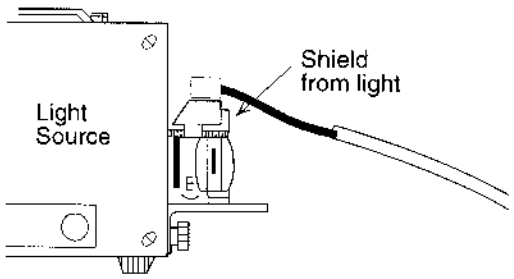
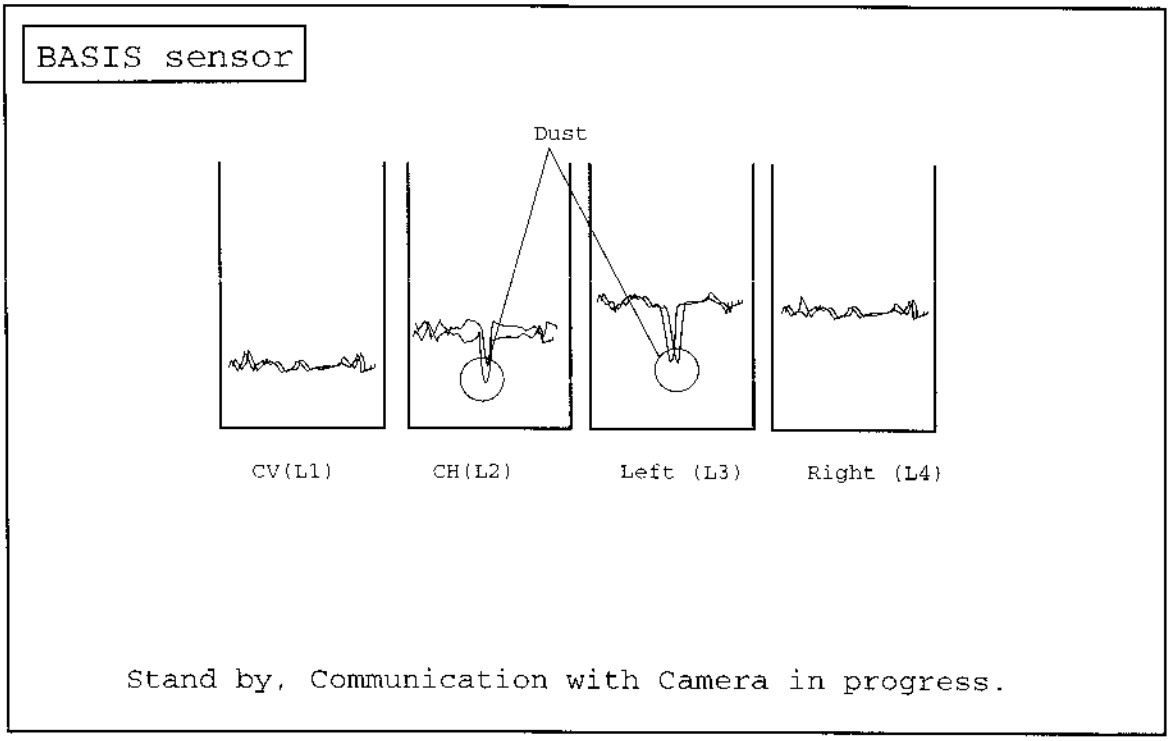


Fig. 3-54 AF Sensor Dust Check

Select F3 Basis Sensor Data Output on the AF menu screen to display the image data.

Check whether the output waveform is linear. If not, dust may be on the AF sensor.

AFBASIS



4.12 DEFOCUS DATA CHECK

PURPOSE:

This procedure is used to check the AF focus adjustment.

TOOLS:

Personal computer
RS-232C cable
HS-I/F
Adjustment software (stored on a work disk)
Light
Tripod
AF reference chart, 16mm bar chart, and 45° chart

CONFIRMATION PROCEDURE:

1) Set the charts and camera as indicated in AF Focus Adjustment (Section 4.10)
2) Select the F3 AF Adjustment Menu.
3) Focus with AF on the chart, and then switch the lens to manual.
4) Select F4 Defocus Data Output. Switch to the various charts. Focus with AF on each chart, and check that the results are within the listed limits.
5) If the standards cannot be met, replace the AF Unit.

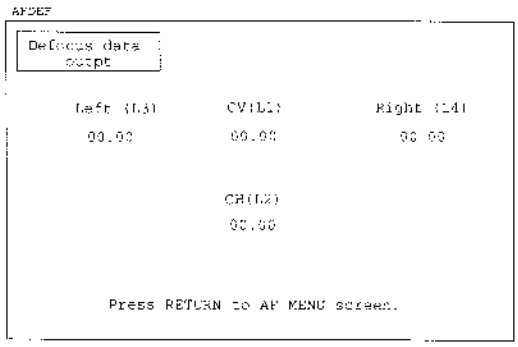


Table 3-2 Defocus Standards

	AF Reference Chart			16mm Bar Chart			45° Bar Chart		
	CV	CH	L&R	CV	CH	L&R	CV	CH	L&R
50mm *f*/1.8 Tool Lens	± 0.03	± 0.03	± 0.04	± 0.03	± 0.06	± 0.08	± 0.12	± 0.14	± 0.13

4.13 AF Focus Shift

Purpose:

To correct minute AF defocus that many result from use of a lens with very shallow depth of focus, such as EF 50 *f*/1.0 L, EF 85 *f*/1.2 L and EF 135 *f*/2.8SF.

AF focus shift must never be used to correct defocus caused by any lenses other than EF 50 *f*/1.0 L,EF 85 *f*/1.2 L or EF 135 *f*/2.8SF.

Minute Defocus:

EOS Series cameras and lenses are designed so that their defocus does not exceed standard values of 0+0.03mm and 0+0.02mm respectively. EF 50 *f*/1.0 L, EF 85 *f*/1.2 L and EF 135 *f*/2.8SF also conform to these standards. However, these lenses have very shallow depth of focus. Therefore, when used together with a camera whose defocus has the same

sign, the lenses may exceed the acceptable depth of focus even if the defocus of both the lenses and the camera conform to the standards. In this event, the user of the lenses may complain of unsharp focus.

Example) Unsatisfactory combination of camera and lens (Camera: 0+0.03mm Lens: 0+0.02mm)

AF focus shift is intended to correct total AF defocus resulting from use of a particular camera in combination with a lens with a shallow depth of focus. Therefore, AF focus shift must always be made on that camera and lens.

AF focus shift must also be made after adjusting both the camera and lens.

A lens with a shallow depth of focus may prove in focus without AF focus shift despite is user's complaint. This phenomenon can be attributed to the following:

(1) Variations in range measurement that result from shooting of an object difficult to focus.

(2) Shift of an object in the period between turning on of SW2 and exposure.

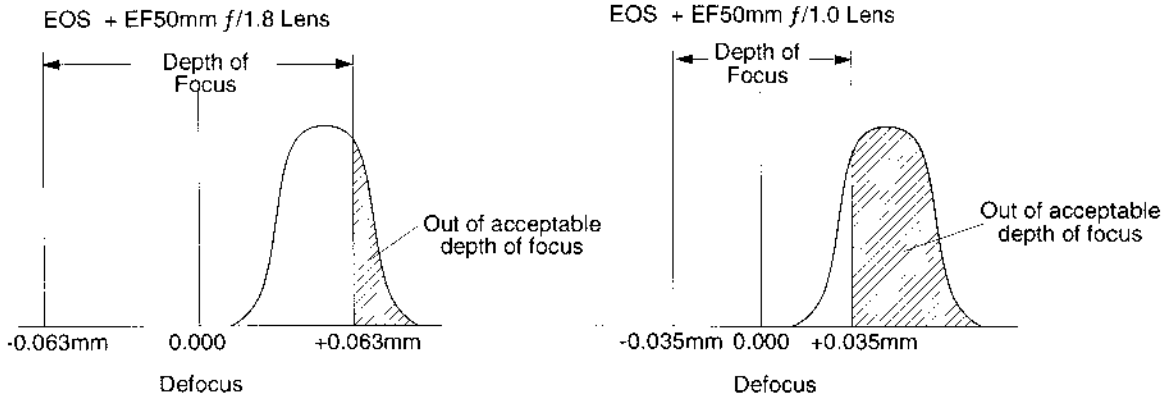


Fig. 3-55 Minute Defocus

TOOLS:

Customer's lens
Personal computer
RS-232C cable
HS-I/F
Adjustment software (stored on a work disk)
Light
Tripod
AF reference chart

PREPARATION:

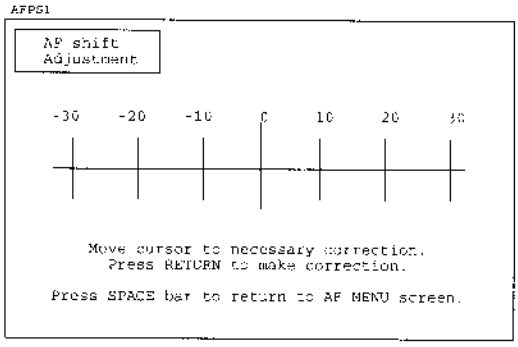
1) Set lighting equipment etc. for AF Focus Adjustment.
2) Select the F3 AF Adjustment Menu.
3) Set the AF reference chart 2.5m ± 10mm from the camera.

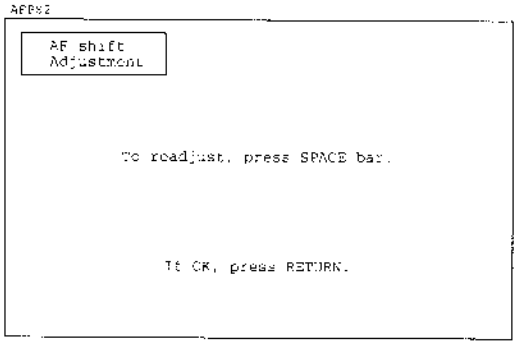
ADJUSTMENT:

1) Select AF Focus Shift on the AF menu screen to display this screen. Move the cursor to the position of -30 and press Return.
2) Attach the customer's lens and press SW1 to focus and shoot the object ten times (with the aperture fully open).
3) After shooting, confirm that the screen shown at the right appears. Press the Space key to return to the screen displayed in step 1). Move the cursor to the position of +30 and press Return to reset the AF focus shift to zero.

   Shoot the object ten times in the same manner as in step 2).
4) Press the Space key to return to the screen displayed in step 1). Move the cursor to the position of +30 and press the Return key. Shoot the object ten times as in step 2).
5) Press the Space key to return to the screen displayed in step 1). Move the cursor to the position of -30 and press Return to reset the AF focus shift amount to zero. Review the results obtained from shooting on the screen displayed in step 1) and select the optimum one.

   Press the Return key to complete AF focus shift.





<MEMO>

4.14 FLASH ADJUSTMENT

If the main flex or TTL (OTF) sensor is replaced, this adjustment is mandatory. If this adjustment is done, the shutter adjustment must be done after it.

PURPOSE:

To adjust the output level and gain of the flash sensor for correct flash film plane exposure.

Standard:

Average ±1EV or less

TOOLS:

Personal computer RS-232C cable HS-1/F

Adjustment program (stored on a work disk)

EF-8000 (Direct flash sensor DIR201)

EF50mm *f*/1.8 production lens

Speedlite (300 EZ, 420 EZ, or 430 EZ)

Tripod

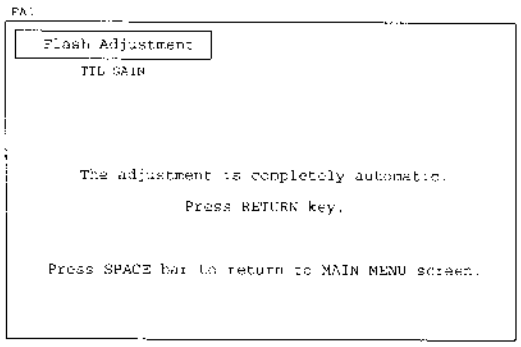
Ambient light should be under EV3. If a dark room is not available, establish a test area with stable conditions and no highly reflective objects. Test about ten cameras from stock and establish an average.

PREPARATION:

1) Run the adjustment software, and select F4 Flash Adjustment.
2) Fix the camera on the tripod and attach the EF50mm *f*/1.8 production lens and speedlite to the camera. Set the camera to ISO 100, shutter to 1/125, and aperture to about *f*/5.6. Set the speedlite in TTL mode and position the camera 2m ± 10mm away from the reflector.

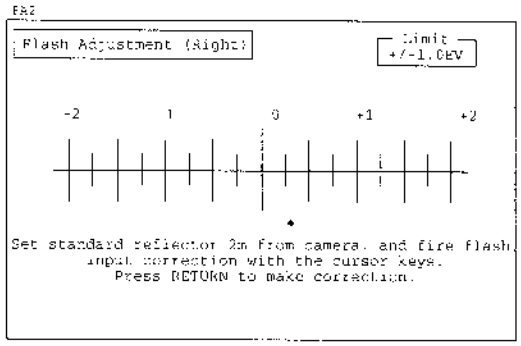
ADJUSTMENT:

1) Gain adjustment is automatic. Press Return.



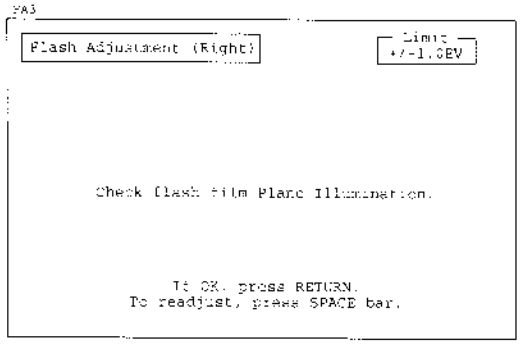
2) After the gain adjustment, the level of the right sensor is adjusted. Measure the flash accuracy of the camera several times and use the cursor keys to move the cursor to the position of a desired value for correcting the measured flash accuracy. Press the Return key.

*: Turn Speedlite off once, and turn back on to insure correct communications.



3) Check the flash level in accordance with the directions displayed on the screen. If the flash accuracy is acceptable, press the Return key to go to the next sensor automatically. If flash level is not correct, press the Space bar and readjust.

*: Turn Speedlite off once, and turn back on to insure correct communications.



4) Cary out the adjustment for the center and left sensor using the same method as the right sensor.

4.15 INHIBIT VOLTAGE ADJUSTMENT

Inhibit voltage check must always be made when replacing the main flex.

PURPOSE:

To insure the operating accuracy of individual parts of the camera by setting the minimum voltage for camera operation.

TOOLS:

Personal computer	RS-232C cable	HS-I/F
DC power supply	Tool battery (CY9-1101-000)	

Adjustment program (stored on a work disk)

EF50mm *f*/1.8 production lens

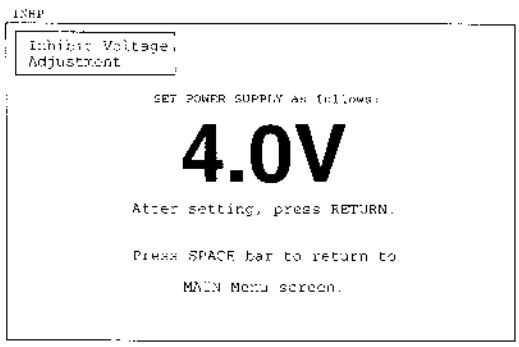
Digital tester

PREPARATION:

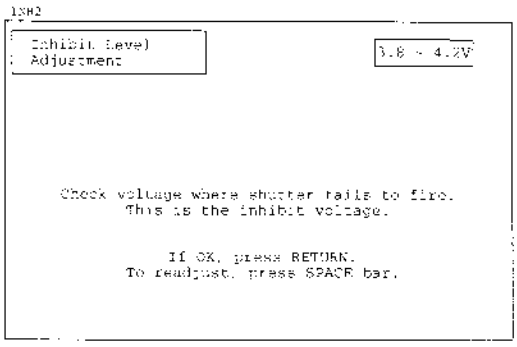
Start adjustment program, connect the camera to the personal computer, and select F5 Inhibit Voltage Adjustment on the menu screen.

ADJUSTMENT:

1) Set supply voltage as indicated on the screen and press the Return key.



2) Check the inhibit voltage as indicated on the screen starting with the highest voltage and work downward.



<MEMO>

4.16 EYE-CONTROLLED FOCUS (ECF) ADJUSTMENT

Eye-controlled Focus Adjustment is necessary when replacing the main flex.

PURPOSE:

To adjust the Eye-controlled Focus IREDs and BASIS sensor as follows:

Dark Adjustment:	Adjust the BASIS dark current.
IRED Current:	To set the output of the IREDs.
Optical Axis Compensation:	To compensate electronically for slight difference in component positions.
Image Magnification Compensation:	as above.
IRED Position Compensation :	as above.

TOOLS:

Personal computer

RS-232C cable

HS-I/F

Adjustment program (stored on a work disk)

Dark Bag

IRED Alignment Tool (CY9-1106)

Mask Holder (CY9-1097) (Two if possible) (established for EOS5 / A2E)

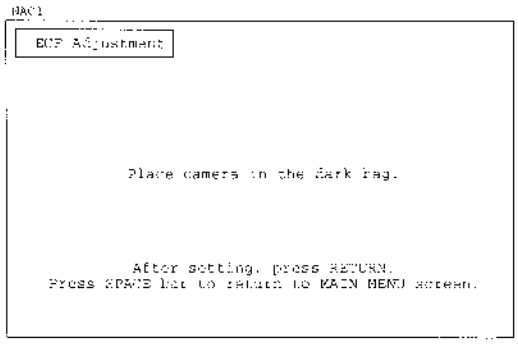
CCD Adjustment Gray Card (19%) for Mask Holder (see EOS 5 / A2E SM, page 3-7)

PREPARATION:

Start adjustment program, connect the camera to the personal computer, and select F6 Eye-controlled Focus Adjustment.

ADJUSTMENT:

1) As indicated on the screen, place the camera in the dark bag and press Return. The adjustment is automatic.



2) After communication this screen appears, set the camera as shown and press Return.

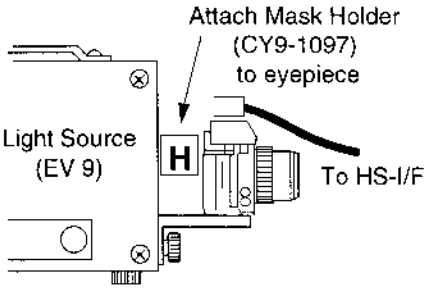
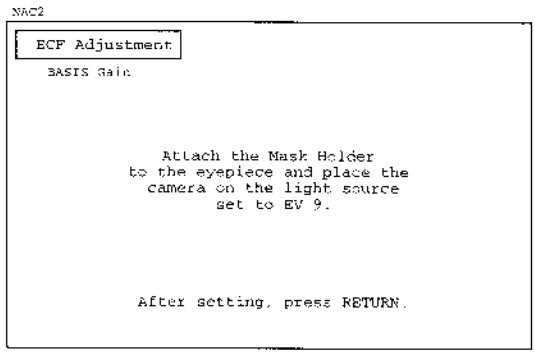


Fig. 3-56 BASIS Adjustment



3) After communication this screen appears, set the camera as shown and press Return.

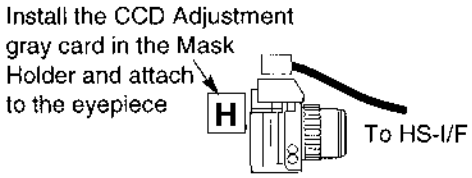
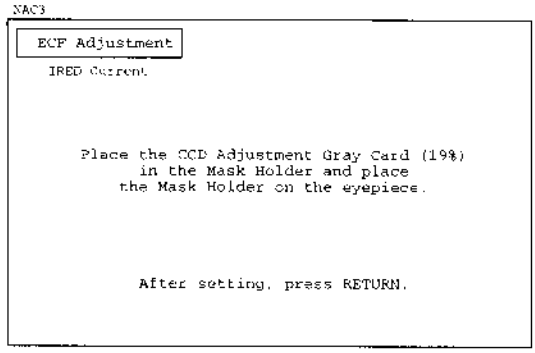


Fig. 3-57 IRED Current Adjustment


NAC3
ECF Adjustment
IRED Current
Place the CCD Adjustment Gray Card (19%)
in the Mask Holder and place
the Mask Holder on the eyepiece.
After setting, press RETURN.

4) After communication this screen appears, set the camera as shown and press Return.

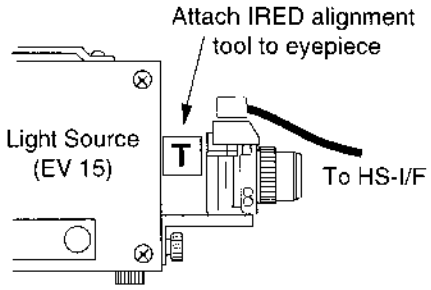
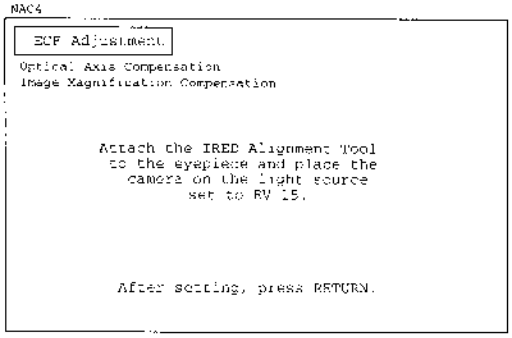


Fig. 3-58 Sensor Position Compensation



5) After communication this screen appears, set the camera as shown and press Return.

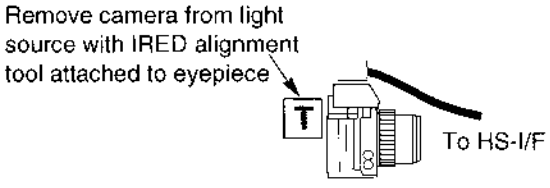
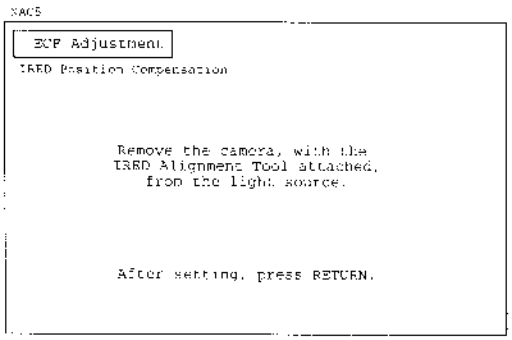


Fig. 3-59 IRED Position Compensation



6) This completes the adjustment. After communications, the Main Menu reappears.

4.17 SELF CHECK

Self check can be classified into the following types:

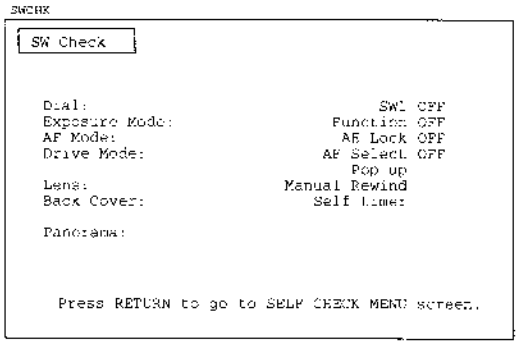
PREPARATION:

Start adjustment program, connect the camera to the personal computer, and select F7Self Check on the menu screen to display the self check menu screen. Select the required screen.

1. SW check:
2. LCD check:

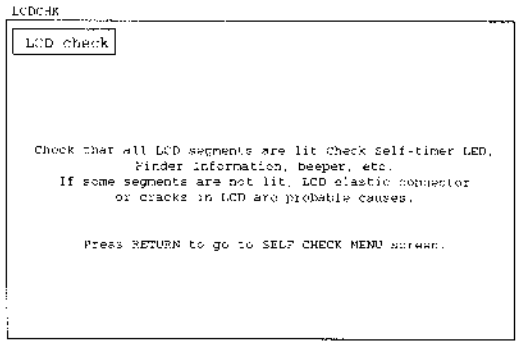
SW CHECK:

Press the F1 key to display the screen. Any switch whose state fails to coincide with that displayed on this screen is suspected of being faulty.Press the Return key to return to the self check menu screen.



LCD CHECK:

Press the F2 key to display this screen. Any LCD which fails to come on at this time is suspected of being faulty.Press the Return key to return to the self check menu screen.


LCDCHK
LCD Check
Check that all LCD segments are lit Check Self-timer LED,
Finder Information, beeper, etc.
If some segments are not lit, LCD elastic connector
or cracks in LCD are probable causes.
Press RETURN to go to SELF CHECK MENU screen.

4.18 Data Transfer

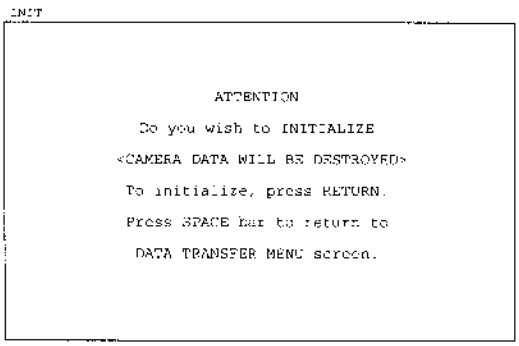
The data transfer menu consist of five operations:

1. **Initialization:** Transferring default data to the camera and setting the model designation if it was impossible to store camera data before replacing the main flex.
2. **Storage:** Storing camera data in the PC.
3. **Transfer:** Transferring stored camera data back to the camera.
4. **Temperature compensation:** Storing temperature corrections in the memory of the camera to correct measuring errors made by the internal thermometer of the camera. This data is used in the AE and AF sequences.)
5. **Counter Reset:** This resets the internal frame counter to zero.

Initialization

PROCEDURE:

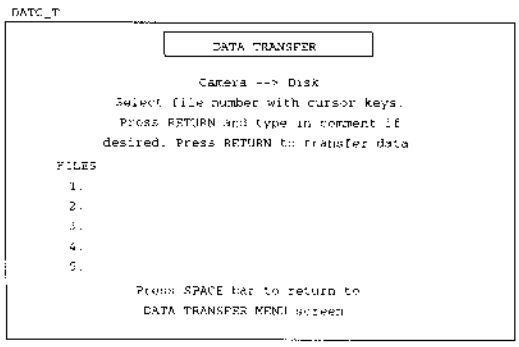
Confirm that the screen shown appears. When choosing to initialize camera data, press the Return key. Otherwise, press the Space key to return to the data transfer menu screen.



Storage

PROCEDURE:

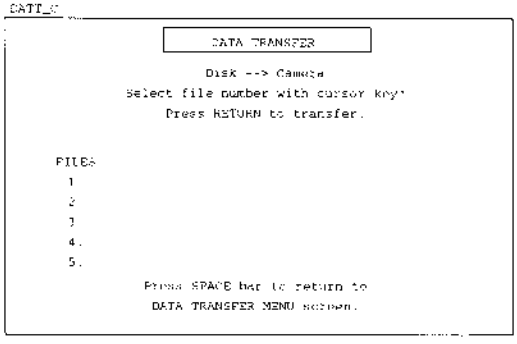
Press the F2 key to display the screen shown at the right. Press the cursor keys to move the cursor to the file position in which camera data is to be stored. Press the Return key to move the cursor to the comment column and enter your comment. Then, press the Return key again to return to the data transfer menu screen.



Transfer

PROCEDURE:

Press the F3 key to display the screen shown at the right. Press the cursor keys to move the cursor to the position of a file which contains the camera data to be transferred to camera.Press the Return key to transfer the data back to the camera. After communications are completed, the data transfer menu screen will reappear.

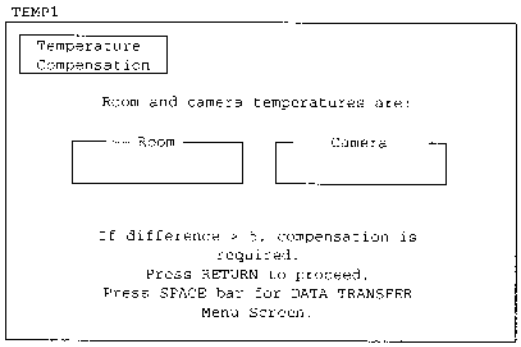


Temperature Compensation

CAUTION Allow the camera five minutes rest time with the switch off before continuing with this procedure.

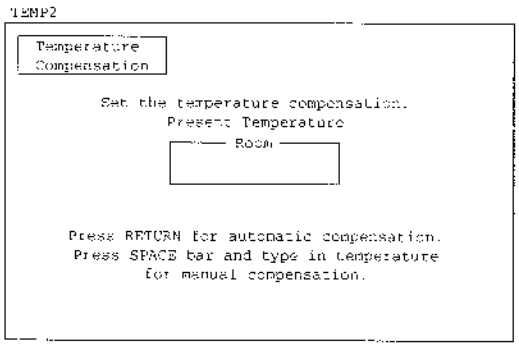
PROCEDURE:

Press the F4 key to display this screen, showing the room temperature measured by the HS-I/F and the temperature measured by the camera. Check whether there is a difference of more than 3°C between the two.



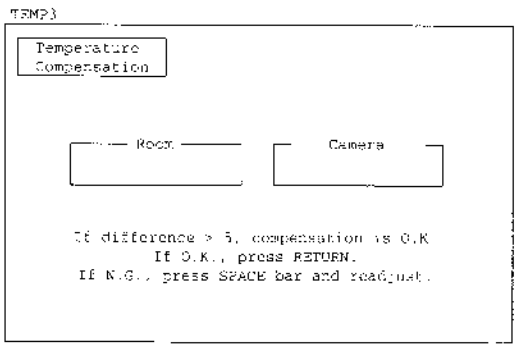
If so, press the Return key to display the next screen showing the room temperature measured by HS-I/F. Check whether the room temperature is normal. If so, press the Return key to return to the data transfer menu screen.

If not, press the Space key to move the cursor to the position of the room temperature. Then, press the numeric keys to enter actual room temperature measured with a thermometer.



Press the Return key to display the next screen , showing the room temperature measured by HS-I/F and the temperature measured by the camera. Check whether there is a difference of more than 3°C between the two.

If so, press the Space key to correct the room temperature again. If not, press the Return key to the data transfer menu screen.



Part 4

Parts Catalog

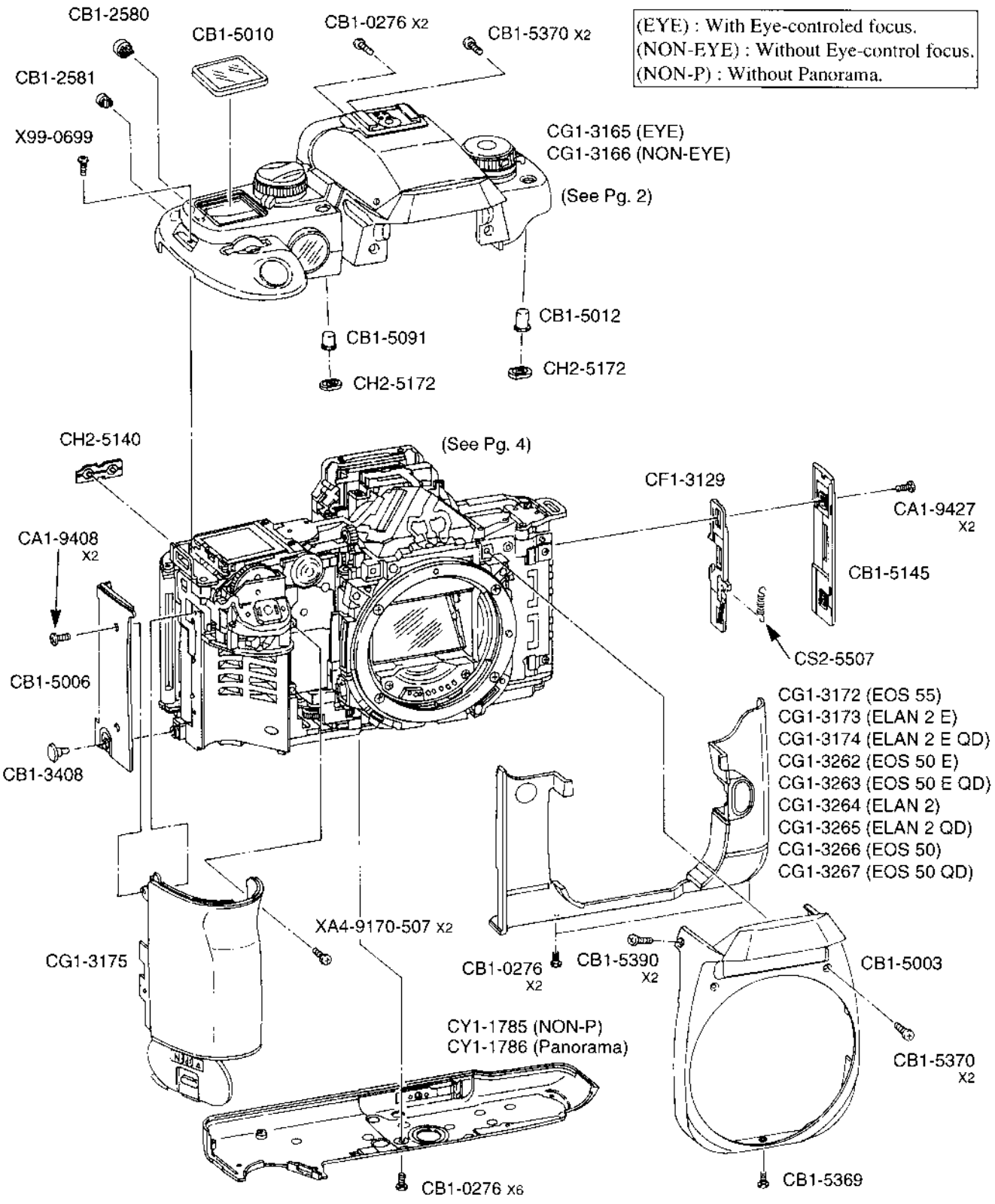
Canon

EOS 55	C12-8281
EOS ELAN II E / QD	C12-8283, 84
EOS 50 E / QD	C12-8286, 87
EOS ELAN II / QD	C12-8293, 94
EOS 50 / QD	C12-8296, 97

PARTS CATALOG

CANON EOS 55 REF. C12-8281
ELAN 2 E / QD C12-8283, 8284
EOS 50 E / QD C12-8286, 8287
ELAN 2 / QD C12-8293, 8294
EOS 50 / QD C12-8296, 8297

(EYE) : With Eye-controled focus.
(NON-EYE) : Without Eye-control focus.
(NON-P) : Without Panorama.



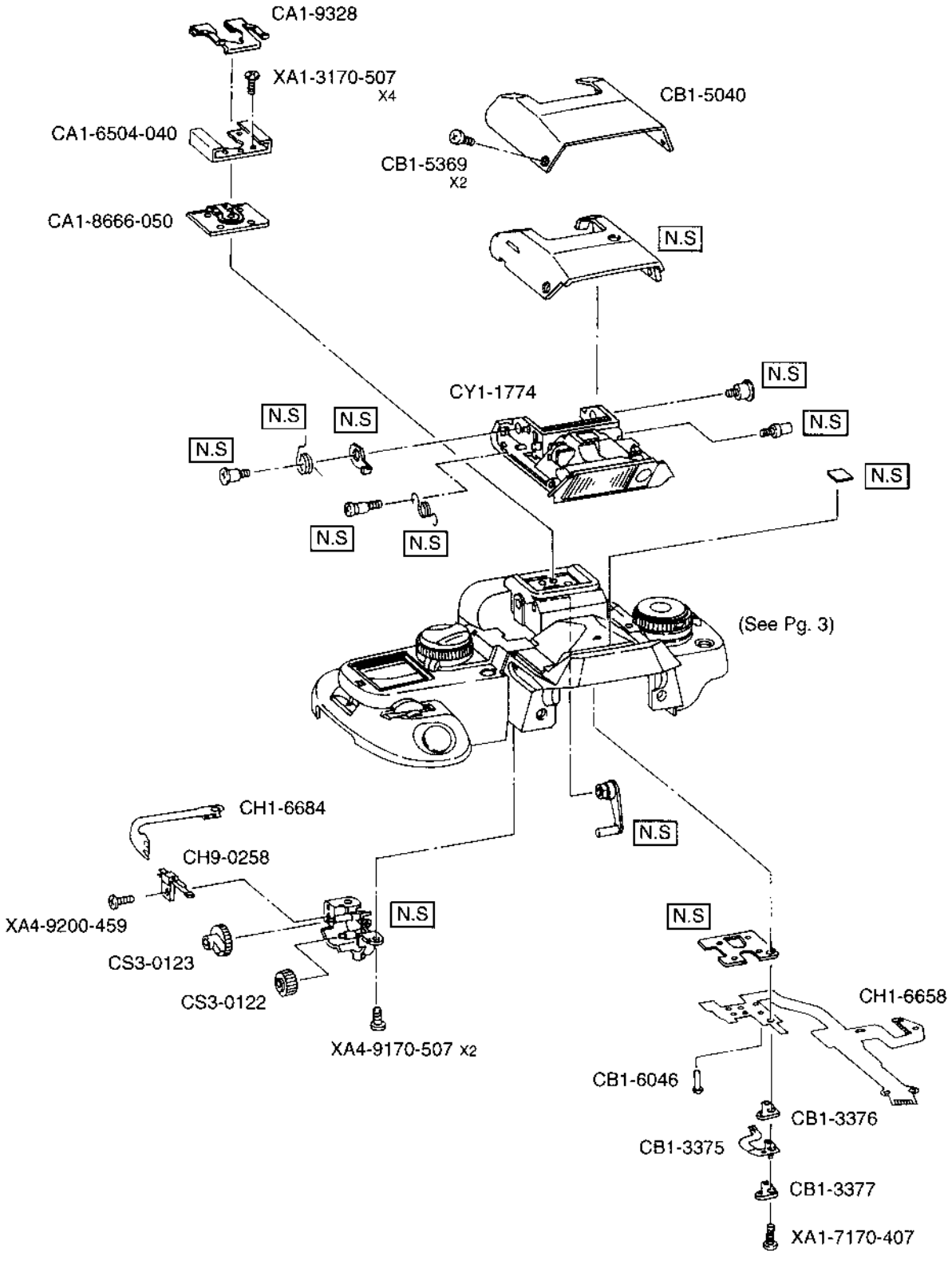
PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA1-9408-000		2	SCREW	
	CA1-9427-000		2	SCREW	
	CB1-0276-000		10	SCREW	
	CB1-2580-000	E	1	BUTTON, AE LOCK	AEロックボタン
	CB1-2581-000	E	1	BUTTON, CAL	測距点選択ボタン
	CB1-3408-000	C	1	CAP, REMOTE	リモートターミナルキャップ
*	CB1-5003-000	C	1	COVER, MOUNT	エプロン
*	CB1-5006-000	D	1	COVER, HINGE	ヒンジカバー
*	CB1-5010-000	C	1	WINDOW, LCD	LCD窓
*	CB1-5012-000	E	1	BUTTON, TOP 1	セルフタイマーボタン
*	CB1-5091-000	E	1	BUTTON, TOP 2	ストロボボタン
*	CB1-5145-000	D	1	COVER, BACK COVER LATCH	背蓋ラッチカバー
*	CB1-5369-000		1	SCREW	
*	CB1-5370-000		4	SCREW	
*	CB1-5390-000		2	SCREW	
*	CF1-3129-000	E	1	LEVER, BACK COVER LATCH	背蓋ラッチレバー
*	CG1-3165-000	D	1	COVER ASS'Y, TOP (EYE)	上カバー（視線有り）
*	CG1-3166-000	D	1	COVER ASS'Y, TOP (NON-EYE)	上カバー（視線なし）
*	CG1-3172-000	D	1	COVER, FRONT (EOS 55)	前カバー
*	CG1-3173-000	D	1	COVER, FRONT (ELAN 2E)	前カバー
*	CG1-3174-000	D	1	COVER, FRONT (ELAN 2E QD)	前カバー
*	CG1-3175-000	D	1	GRIP UNIT	グリップユニット
*	CG1-3262-000	D	1	COVER, FRONT (EOS 50E)	前カバー
*	CG1-3263-000	D	1	COVER, FRONT (EOS 50E QD)	前カバー
*	CG1-3264-000	D	1	COVER, FRONT (ELAN 2)	前カバー
*	CG1-3265-000	D	1	COVER, FRONT (ELAN 2 QD)	前カバー
*	CG1-3266-000	D	1	COVER, FRONT (EOS 50)	前カバー
*	CG1-3267-000	D	1	COVER, FRONT (EOS 50 QD)	前カバー
*	CH2-5140-000	D	1	CONTACT, RUBBER	背面スイッチ
*	CH2-5172-000	D	2	CONTACT, RUBBER	上カバースイッチ
	CS2-5507-000	E	1	SPRING, COIL	背蓋ラッチスプリング
*	CY1-1785-000	C	1	COVER, BOTTOM (NON-P)	下カバー（ノーマル）
*	CY1-1786-000	C	1	COVER, BOTTOM (PANORAMA)	下カバー（パノラマ）
	X99-0699-000		1	SCREW	
	XA4-9170-507		2	SCREW	

CANON

EOS 55	REF. C12-8281
ELAN 2 E / QD	C12-8283, 8284
EOS 50 E / QD	C12-8286, 8287
ELAN 2 / QD	C12-8293, 8294
EOS 50 / QD	C12-8296, 8297

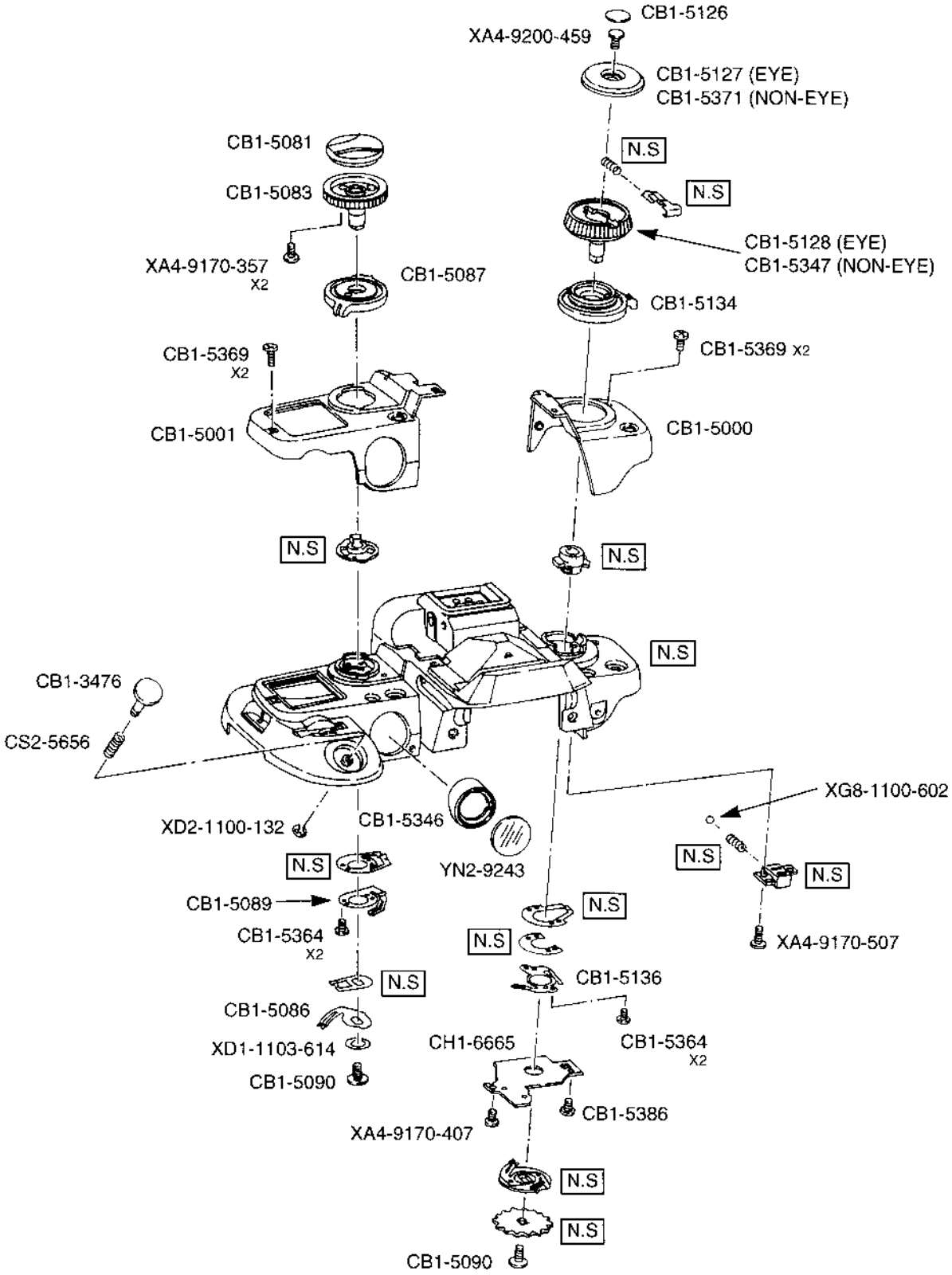


PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA1-6504-040	E	1	SHOE, ACCESSORY	アクシュー
	CA1-8666-050	E	1	BASE, ACC. SHOE	アクシューベース
	CA1-9328-000	E	1	SPRING, PLATE	アクシュースプリング
	CB1-3375-000	E	1	CONTACT, SHOE IN USE	シュービジー接片
	CB1-3376-000	E	1	BASE, SHOE IN USE 1	シュービジー接片座1
	CB1-3377-000	E	1	BASE, SHOE IN USE 2	シュービジー接片座2
*	CB1-5040-000	C	1	COVER, FLASH	ストロボカバー
*	CB1-5369-000		2	SCREW	
*	CB1-6046-000	E	1	PIN, ACC. SHOE	アクシューピン
*	CH1-6658-000	D	1	FPC, TOP	上カバーフレキ
*	CH1-6684-000	D	1	FPC, POP-UP SWITCH	ポップアップSWフレキ
*	CH9-0258-000	E	1	SWITCH, LEAF	ポップアップスイッチ
*	CS3-0122-000	E	1	GEAR, FLASH 4	ストロボ伝達ギア4
*	CS3-0123-000	E	1	GEAR, CAM FLASH	ストロボカムギア
*	CY1-1774-000	D	1	FLASH HEAD UNIT	ストロボ発光部ユニット
	XA1-3170-507		4	SCREW	
	XA1-7170-407		1	SCREW	
	XA4-9170-507		2	SCREW	
	XA4-9200-459		1	SCREW	

CANON	EOS 55	REF. C12-8281
	ELAN 2 E / QD	C12-8283, 8284
	EOS 50 E / QD	C12-8286, 8287
	ELAN 2 / QD	C12-8293, 8294
	EOS 50 / QD	C12-8296, 8297

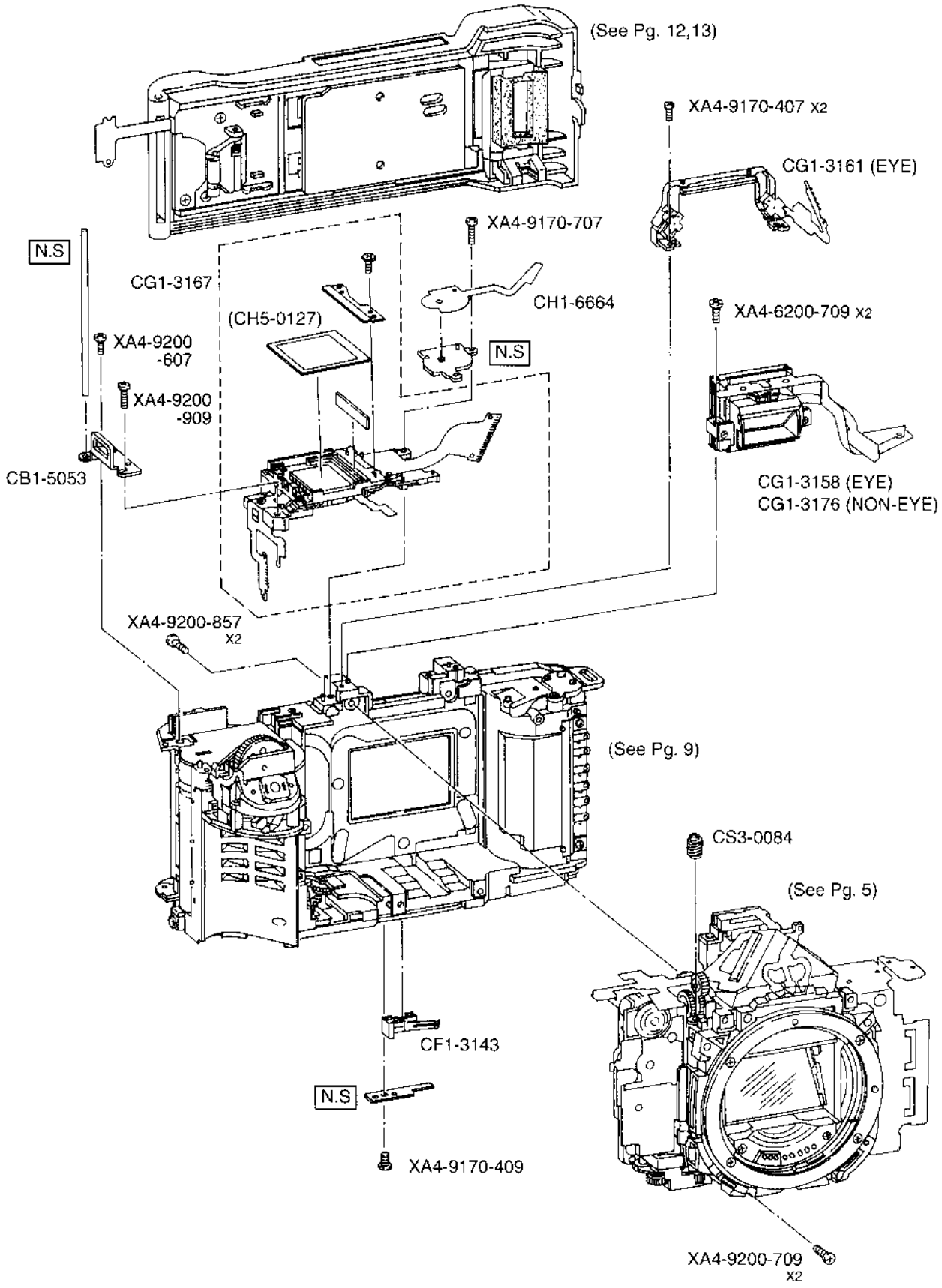


PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CB1-3476-000	D	1	BUTTON, RELEASE	レリーズボタン
*	CB1-5000-000	D	1	COVER, TOP 1	左上カバー
*	CB1-5001-000	D	1	COVER, TOP 2	右上カバー
*	CB1-5081-000	D	1	COVER, AF MODE DIAL	AFモードダイヤル蓋
*	CB1-5083-000	D	1	DIAL, AF MODE	AFモードダイヤル
*	CB1-5086-000	E	1	CONTACT, AF MODE DIAL	AFダイヤル接片
*	CB1-5087-000	D	1	DIAL, DRIVE MODE	給送モードダイヤル
*	CB1-5089-000	E	1	CONTACT, DRIVE MODE DIAL	給送モードダイヤル接片
*	CB1-5090-000		2	SCREW	
*	CB1-5126-000	D	1	CAP, BLIND	化粧蓋
*	CB1-5127-000	D	1	COVER, COMMAND DIAL (EYE)	コマンドダイヤル蓋（視線有り）
*	CB1-5128-000	D	1	DIAL, COMMAND (EYE)	コマンドダイヤル（視線有り）
*	CB1-5134-000	D	1	DIAL, METERING	測光ダイヤル
*	CB1-5136-000	E	1	CONTACT, METERING DIAL	測光ダイヤル接片
*	CB1-5346-000	D	1	COVER, AF LED	AF補助光カバー
*	CB1-5347-000	D	1	DIAL, COMMAND (NON-EYE)	コマンドダイヤル（視線なし）
*	CB1-5364-000		4	SCREW	
*	CB1-5369-000		4	SCREW	
*	CB1-5371-000	D	1	COVER, COMMAND DIAL (NON-EYE)	コマンドダイヤル蓋（視線なし）
*	CB1-5386-000		1	SCREW	
*	CH1-6665-000	D	1	PCB, COMMAND DIAL	コマンドダイヤル基板
	CS2-5656-000	E	1	SPRING, COIL	レリーズボタンスプリング
	XA4-9170-357		2	SCREW	
	XA4-9170-407		1	SCREW	
	XA4-9170-507		1	SCREW	
	XA4-9200-459		1	SCREW	
	XD1-1103-614		1	WASHER	ワッシャー
	XD2-1100-132		1	E RING	Eリング
	XG8-1100-602		1	BOLL	ボール
*	YN2-9243-000	D	1	PANEL, AF LED	AF補助光パネル

CANON EOS 55 REF. C12-8281
ELAN 2 E / QD C12-8283, 8284
EOS 50 E / QD C12-8286, 8287
ELAN 2 / QD C12-8293, 8294
EOS 50 / QD C12-8296, 8297

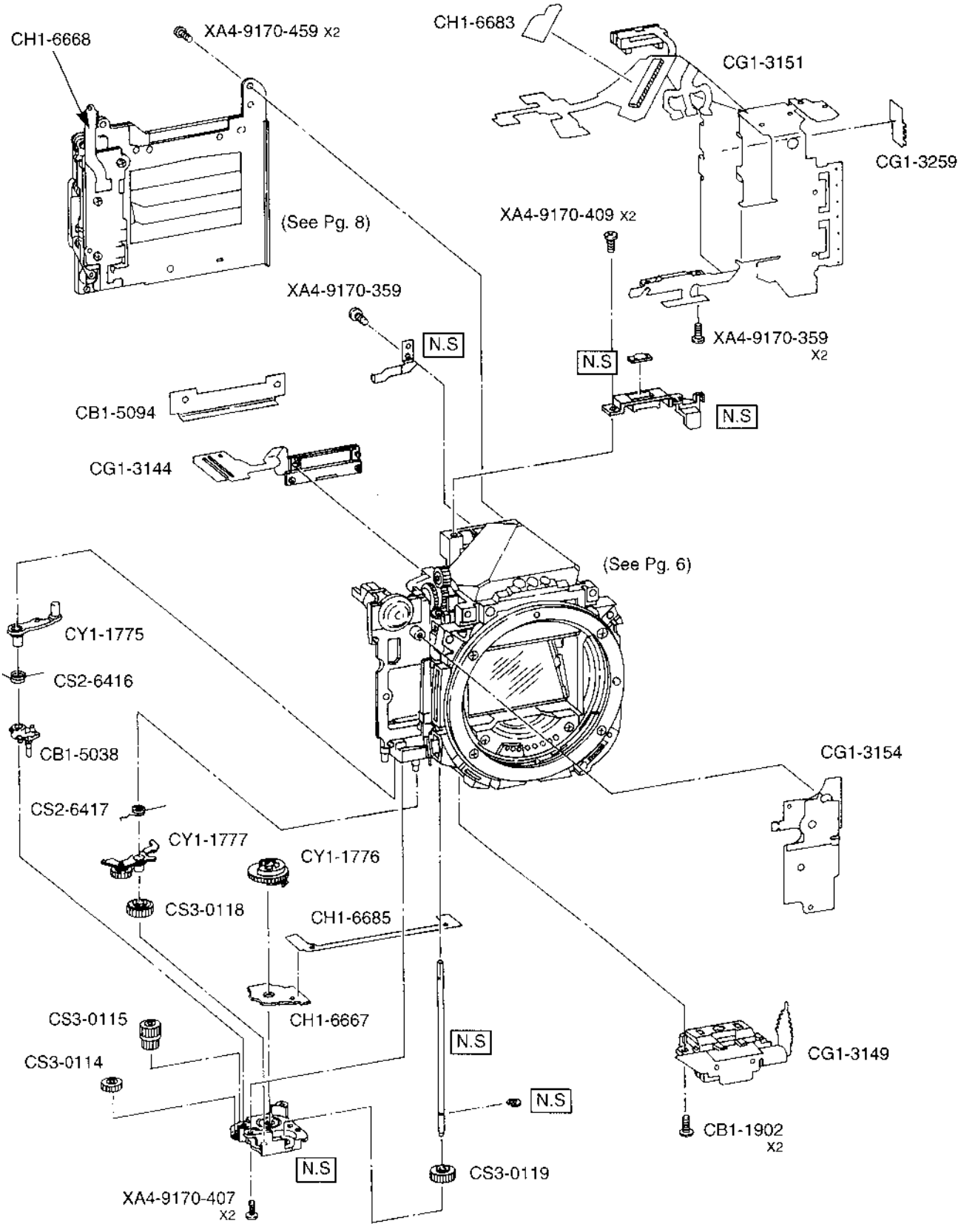


PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
*	CB1-5053-000	D	1	LUG, NECK STRAP	縦耳環
*	CF1-3143-000	E	1	CONTACT, PANORAMA	パノラマ接片ユニット
*	CG1-3158-000	D	1	EYEPIECE UNIT (EYE)	接眼／視線入力ユニット
*	CG1-3161-000	D	1	HV UNIT	HVユニット
*	CG1-3167-000	D	1	LCD UNIT	LCDユニット
*	CG1-3176-000	D	1	EYEPIECE UNIT (NON-EYE)	接眼レンズユニット
*	CH1-6664-000	D	1	FPC, AF MODE DIAL	AFモードダイヤルフレキ
*	CH5-0127-000	D	1	LCD	LCD
*	CS3-0084-000	E	1	GEAR, WORM	ウォームギア
	XA4-6200-709		2	SCREW	
	XA4-9170-407		2	SCREW	
	XA4-9170-409		1	SCREW	
	XA4-9170-707		1	SCREW	
	XA4-9200-607		1	SCREW	
	XA4-9200-709		2	SCREW	
	XA4-9200-857		2	SCREW	
	XA4-9200-909		1	SCREW	

CANON EOS 55 REF. C12-8281
ELAN 2 E / QD C12-8283, 8284
EOS 50 E / QD C12-8286, 8287
ELAN 2 / QD C12-8293, 8294
EOS 50 / QD C12-8296, 8297

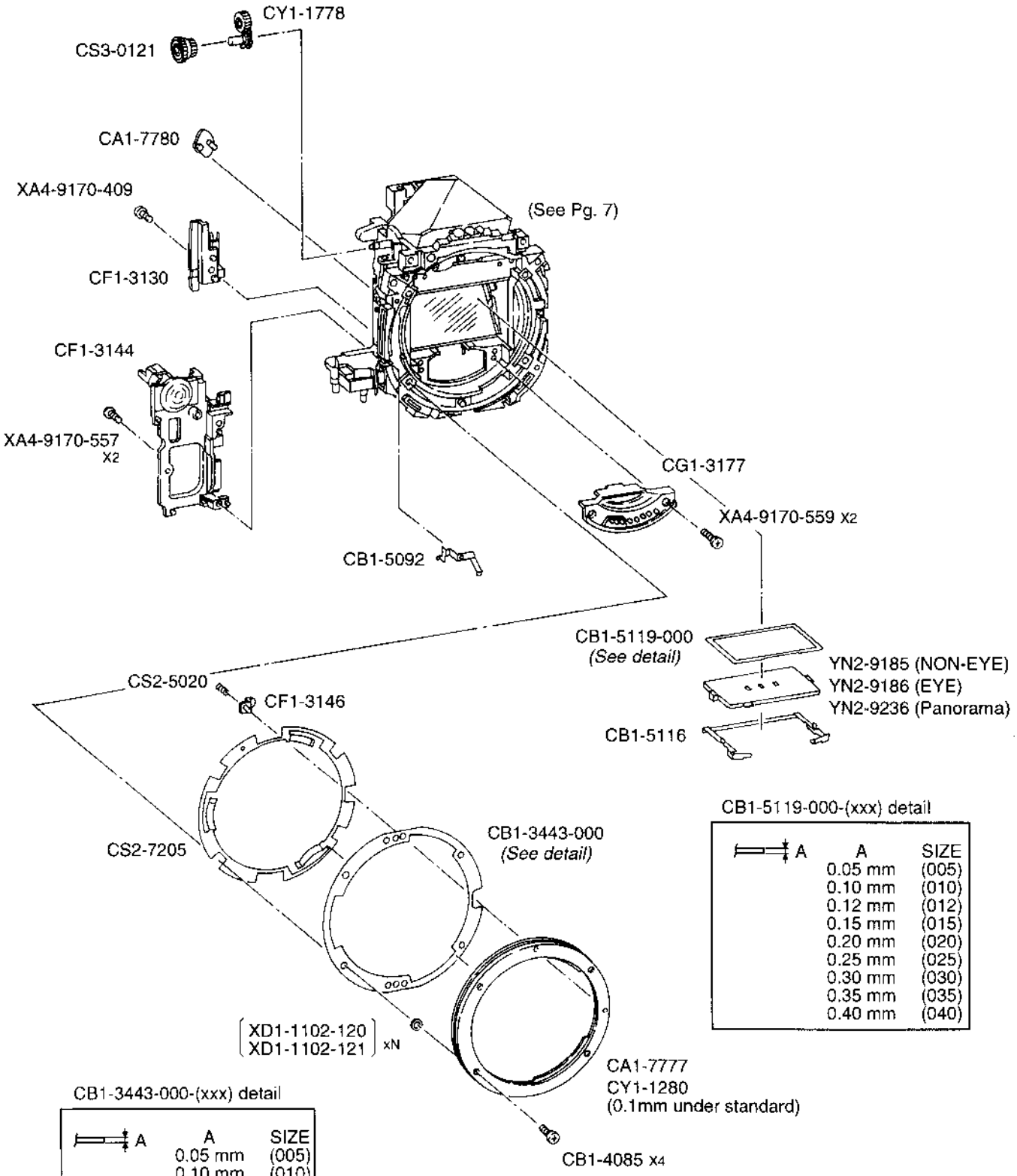


PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CB1-1902-000		2	SCREW	
*	CB1-5038-000	E	1	LEVER, CAM	カムレバー
*	CB1-5094-000	E	1	SHEET, LIGHT SHIELD	遮光シート
*	CG1-3144-000	D	1	VIEWFINDER LCD UNIT	ファインダーLCD
*	CG1-3149-000	D	1	AF UNIT	AFユニット
*	CG1-3151-000	D	1	FPC ASS'Y, MAIN	メインフレキユニット
*	CG1-3154-000	D	1	FPC ASS'Y, DC/DC	DC/DCフレキユニット
*	CG1-3259-000	D	1	FPC ASS'Y, PANORAMA	パノラマフレキ
*	CH1-6667-000	E	1	PCB, PHASE	位相基板
*	CH1-6668-000	E	1	FPC, SHUTTER	シャッターフレキ
*	CH1-6683-000	E	1	FPC, EXTENSION FLASH	ストロボ中継フレキ
*	CH1-6685-000	E	1	FPC, EXTENSION PHASE SIGNAL	位相基板中継フレキ
*	CS2-6416-000	E	1	SPRING, TORSION	遊星ギア切り換えスプリング
*	CS2-6417-000	E	1	SPRING, TORSION	ストロボ切り換えスプリング
*	CS3-0114-000	E	1	GEAR, CHARGE 1	チャージ伝達ギア1
*	CS3-0115-000	E	1	GEAR, CHARGE 2	チャージ伝達ギア2
*	CS3-0118-000	E	1	GEAR, FLASH 2	ストロボ伝達ギア2
*	CS3-0119-000	E	1	GEAR, FLASH 3	ストロボ伝達ギア3
*	CY1-1775-000	E	1	LEVER, CHARGE	チャージレバー
*	CY1-1776-000	E	1	CHARGE CAM GEAR UNIT	チャージカムギア
*	CY1-1777-000	E	1	FLASH ARM UNIT	ストロボ伝達アーム
	XA4-9170-359		3	SCREW	
	XA4-9170-407		2	SCREW	
	XA4-9170-409		2	SCREW	
	XA4-9170-459		2	SCREW	

CANON EOS 55 REF. C12-8281
ELAN 2 E / QD C12-8283, 8284
EOS 50 E / QD C12-8286, 8287
ELAN 2 / QD C12-8293, 8294
EOS 50 / QD C12-8296, 8297



CB1-5119-000-(xxx) detail

A	SIZE
0.05 mm	(005)
0.10 mm	(010)
0.12 mm	(012)
0.15 mm	(015)
0.20 mm	(020)
0.25 mm	(025)
0.30 mm	(030)
0.35 mm	(035)
0.40 mm	(040)

CB1-3443-000-(xxx) detail

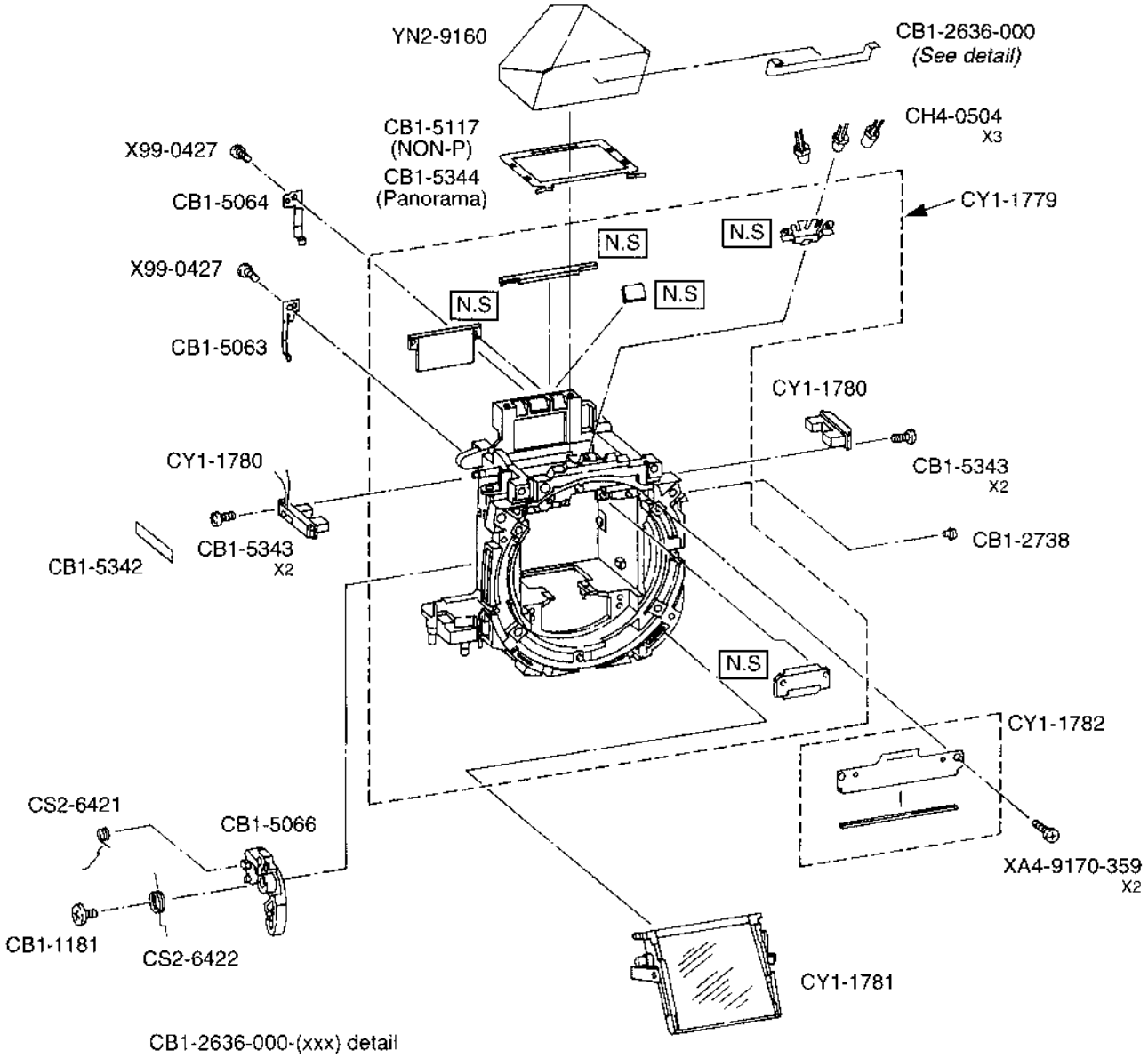
A	SIZE
0.05 mm	(005)
0.10 mm	(010)
0.12 mm	(012)
0.15 mm	(015)
0.18 mm	(018)

PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA1-7777-000	C	1	MOUNT, BODY	マウント
	CA1-7780-000	E	1	LEVER, LENS INTERLOCK	レンズ検知レバー
	CB1-3443-000 (005)	D		SPACER, MOUNT	マウントスペーサー
	(010)	D		SPACER, MOUNT	マウントスペーサー
	(012)	D		SPACER, MOUNT	マウントスペーサー
	(015)	D		SPACER, MOUNT	マウントスペーサー
	(018)	D		SPACER, MOUNT	マウントスペーサー
	CB1-4085-000		4	SCREW	
*	CB1-5092-000	E	1	PLATE, GND	GNDラグ板
*	CB1-5116-000	E	1	HOLDER, FOCUSING SCREEN	ピント板押さえ
*	CB1-5119-000 (005)	D	1	SPACER, FOCUSING SCREEN	ピントワッシャー
*	(010)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	(012)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	(015)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	(020)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	(025)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	(030)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	(035)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	(040)	D		SPACER, FOCUSING SCREEN	ピントワッシャー
*	CF1-3130-000	E	1	CONTACT, LENS INTERLOCK	レンズ検知スイッチ
*	CF1-3144-000	E	1	WING UNIT	ウィングユニット
*	CF1-3146-000	E	1	LEVER, LENS LOCK	レンズロックピン
*	CG1-3177-000	E	1	MOUNT CONTACT UNIT	接点座ユニット
	CS2-5020-000	E	1	SPRING, COIL	ロックピンスプリング
	CS2-7205-000	D	1	SPRING, MOUNT	MIFスプリング
*	CS3-0121-000	E	1	GEAR, FLASH UP	ストロボポップアップ太陽ギア
*	CY1-1778-000	E	1	GEAR ASS'Y, FLASH PLANETARY	ストロボ遊星ギア
	CY1-1280-000	C	1	MOUNT, BODY	マウント
	XA4-9170-409		1	SCREW	
	XA4-9170-557		2	SCREW	
	XA4-9170-559		2	SCREW	
	XD1-1102-120		1	WASHER	
	XD1-1102-121		1	WASHER	
*	YN2-9185-000	D	1	SCREEN, FOCUSING (NON-EYE)	ピント板（視線なし）
*	YN2-9186-000	D	1	SCREEN, FOCUSING (EYE)	ピント板（視線有り）
*	YN2-9236-000	D	1	SCREEN, FOCUSING (PANORAMA)	ピント板（パノラマ）

CANON	EOS 55	REF. C12-8281
	ELAN 2 E / QD	C12-8283, 8284
	EOS 50 E / QD	C12-8286, 8287
	ELAN 2 / QD	C12-8293, 8294
	EOS 50 / QD	C12-8296, 8297



CB1-2636-000-(xxx) detail

A	SIZE
0.30 mm	(030)
0.40 mm	(040)
0.50 mm	(050)
0.60 mm	(060)
0.70 mm	(070)
0.80 mm	(080)

PARTS LIST

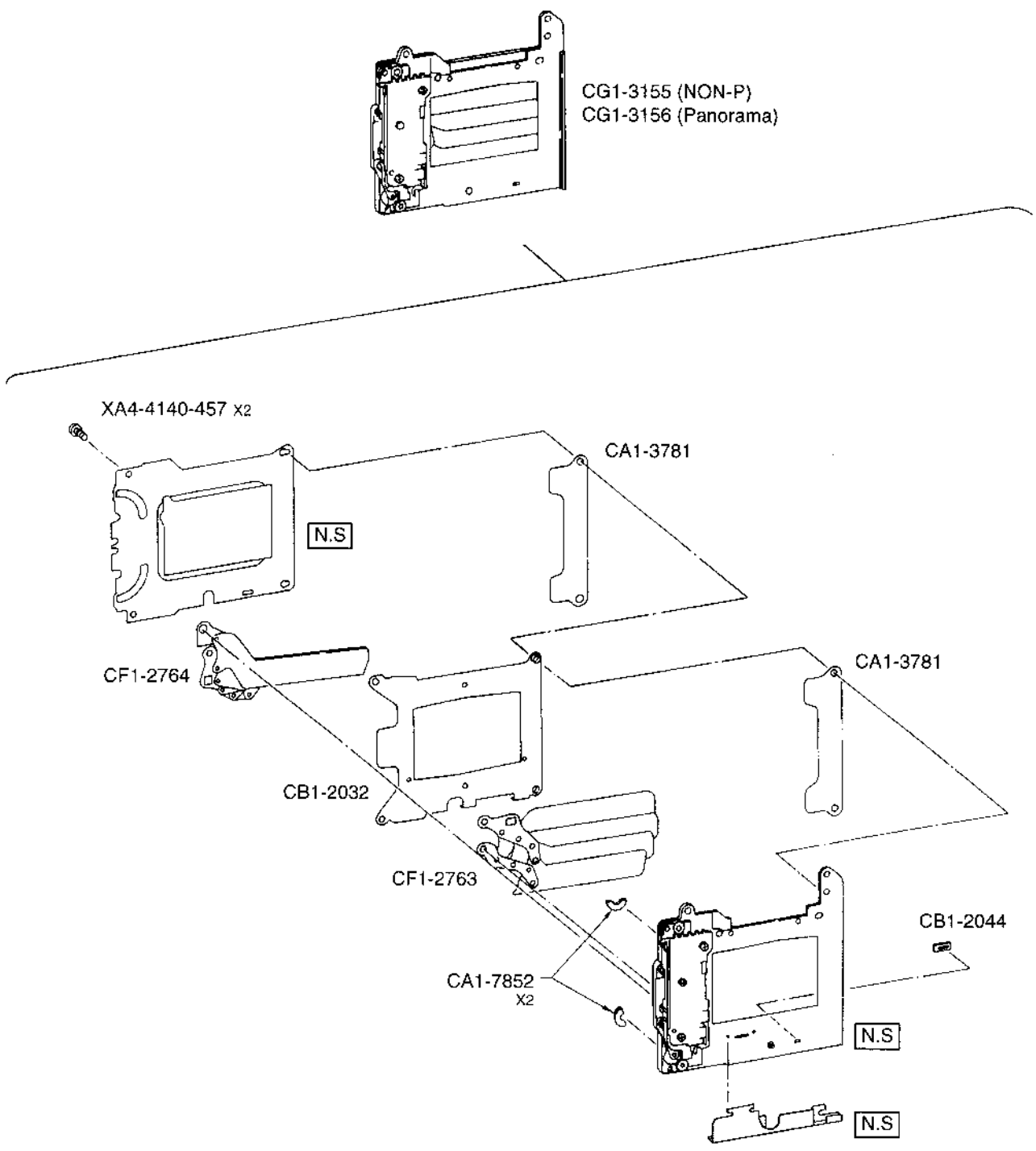
REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CB1-1181-000		1	SCREW	
	CB1-2636-000 (030)	E	1	SPACER, PENTAPRISM	ペンタプリズムスペーサー
	(040)	E		SPACER, PENTAPRISM	ペンタプリズムスペーサー
	(050)	E		SPACER, PENTAPRISM	ペンタプリズムスペーサー
	(060)	E		SPACER, PENTAPRISM	ペンタプリズムスペーサー
	(070)	E		SPACER, PENTAPRISM	ペンタプリズムスペーサー
	(080)	E		SPACER, PENTAPRISM	ペンタプリズムスペーサー
	CB1-2738-000	E	1	STOPPER, SUB MIRROR	サブミラー反転ダボ
*	CB1-5063-000	E	1	HOLDER, MIRROR 1	ミラー押さえ右
*	CB1-5064-000	E	1	HOLDER, MIRROR 2	ミラー押さえ左
*	CB1-5066-000	E	1	LEVER, MIRROR UP	ミラーアップレバー
*	CB1-5117-000	E	1	MASK, FINDER (NON-P)	視野マスク
*	CB1-5342-000	E	1	SHEET, LIGHT SHIELD	P-LEDカバー
*	CB1-5343-000		4	SCREW	
*	CB1-5344-000	E	1	MASK, FINDER (PANORAMA)	視野マスク（パノラマ）
	CH4-0504-000	E	3	LED, SI	SI-LED
*	CS2-6421-000	E	1	SPRING, TORSION	ミラー戻しスプリング
*	CS2-6422-000	E	1	SPRING, TORSION	ミラーアップスプリング
*	CY1-1779-000	E	1	MIRROR BOX UNIT	前板ユニット
*	CY1-1780-000	E	2	PANORAMA LED UNIT	パノラマLEDユニット
*	CY1-1781-000	E	1	MIRROR UNIT	ミラーユニット
*	CY1-1782-000	D	1	PLATE, PROTECTION	前板ボロカクシ
	X99-0427-000		2	SCREW	
	XA4-9170-359		2	SCREW	
	YN2-9160-000	D	1	PENTAPRISM	ペンタプリズム

CANON

EOS 55
ELAN 2 E / QD
EOS 50 E / QD
ELAN 2 / QD
EOS 50 / QD

REF. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297



PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA1-3781-000	E	2	SPACER	スペーサー
	CA1-7852-000	E	2	STOPPER, RUBBER	ストッパー
	CB1-2032-000	E	1	PLATE, SEPARATOR	仕切板
	CB1-2044-000	E	1	STOPPER, SHUTTER CURTAIN	羽根ストッパー
	CF1-2763-000	C	1	CURTAIN, 2ND SHUTTER	後幕ユニット
	CF1-2764-000	C	1	CURTAIN, 1ST SHUTTER	先幕ユニット
*	CG1-3155-000	C	1	SHUTTER UNIT (NON-P)	シャッターユニット
*	CG1-3156-000	C	1	SHUTTER UNIT (PANORAMA)	パノラマシャッターユニット
	XA4-4140-457		2	SCREW	

CANON

EOS 55
ELAN 2 E / QD
EOS 50 E / QD
ELAN 2 / QD
EOS 50 / QD

REF. C12-8281
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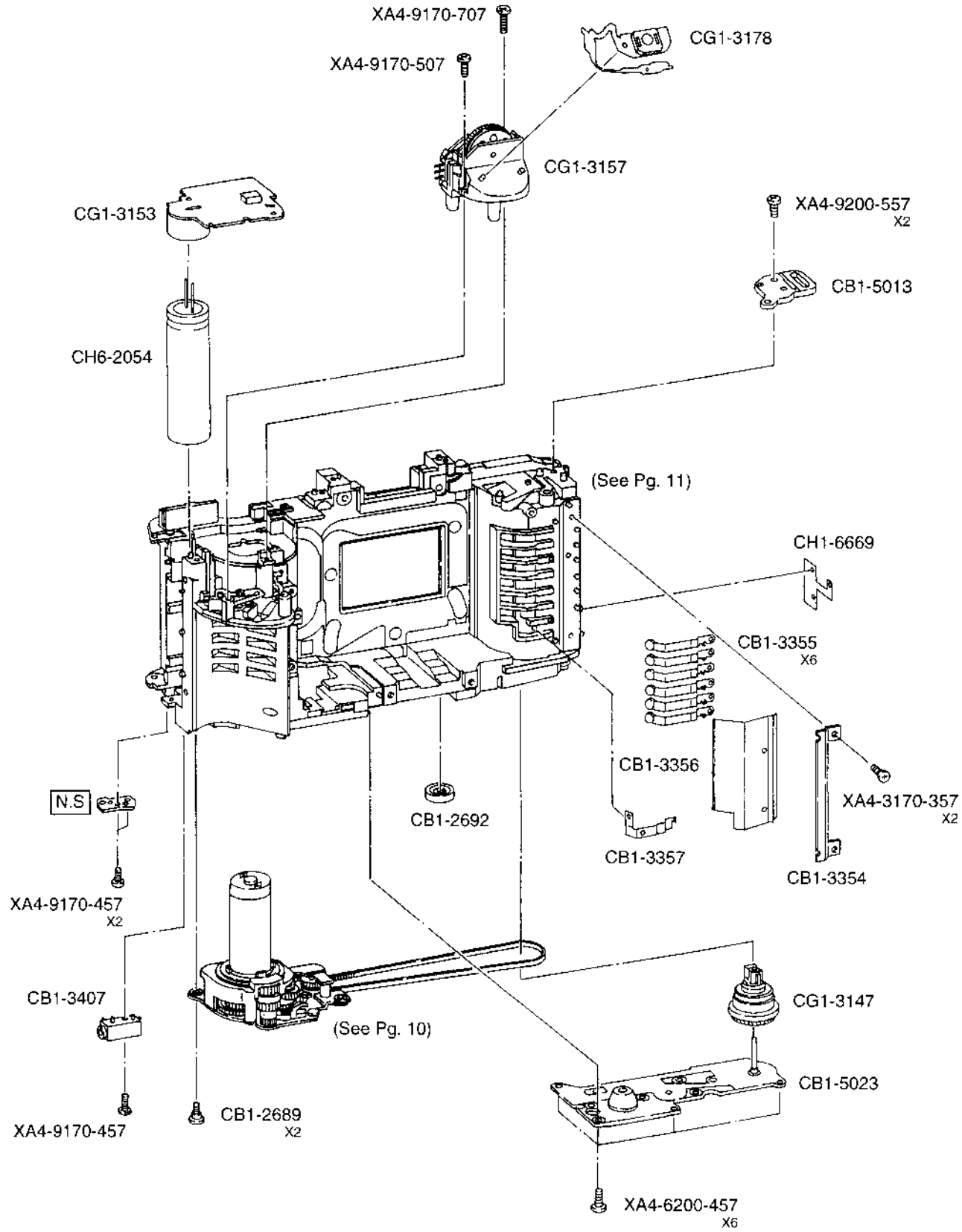
C12-8293, 8294
C12-8296, 8297



PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CB1-2689-000		2	SCREW	
	CB1-2692-000	E	1	PULLEY, IDLER	アイドラー
	CB1-3354-000	E	1	HOLDER, DX	DX押さえ
	CB1-3355-000	E	6	CONTACT, DX	DX接片
	CB1-3356-000	E	1	SHEET, DX	DXシート
	CB1-3357-000	E	1	CONTACT, FILM CARTRIDGE	パトローネ接片
	CB1-3407-000	D	1	TERMINAL, REMOTE	リモコンターミナル
*	CB1-5013-000	D	1	LUG, NECK STRAP	横耳環
*	CB1-5023-000	E	1	BASE, TRIPOD	三脚地板
*	CG1-3147-000	E	1	FORK ASS'Y	フォークユニット
*	CG1-3153-000	D	1	PCB ASS'Y, FLASH	ストロボ基板ユニット
*	CG1-3157-000	D	1	DIAL ASS'Y	電子ダイヤルユニット
*	CG1-3178-000	D	1	FPC ASS'Y, RELEASE	レリーズフレキ
*	CH1-6669-000	E	1	FPC, BACK COVER SWITCH	背蓋スイッチフレキ
*	CH6-2054-000	D	1	CAPACITOR, MAIN	メインコンデンサー
	XA4-3170-357		2	SCREW	
	XA4-6200-457		6	SCREW	
	XA4-9170-457		3	SCREW	
	XA4-9170-507		1	SCREW	
	XA4-9170-707		1	SCREW	
	XA4-9200-557		2	SCREW	

CANON

EOS 55 — REF. C12-8281
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EOS 50 E / QD — C12-8286, 8287
ELAN 2 / QD — C12-8293, 8294
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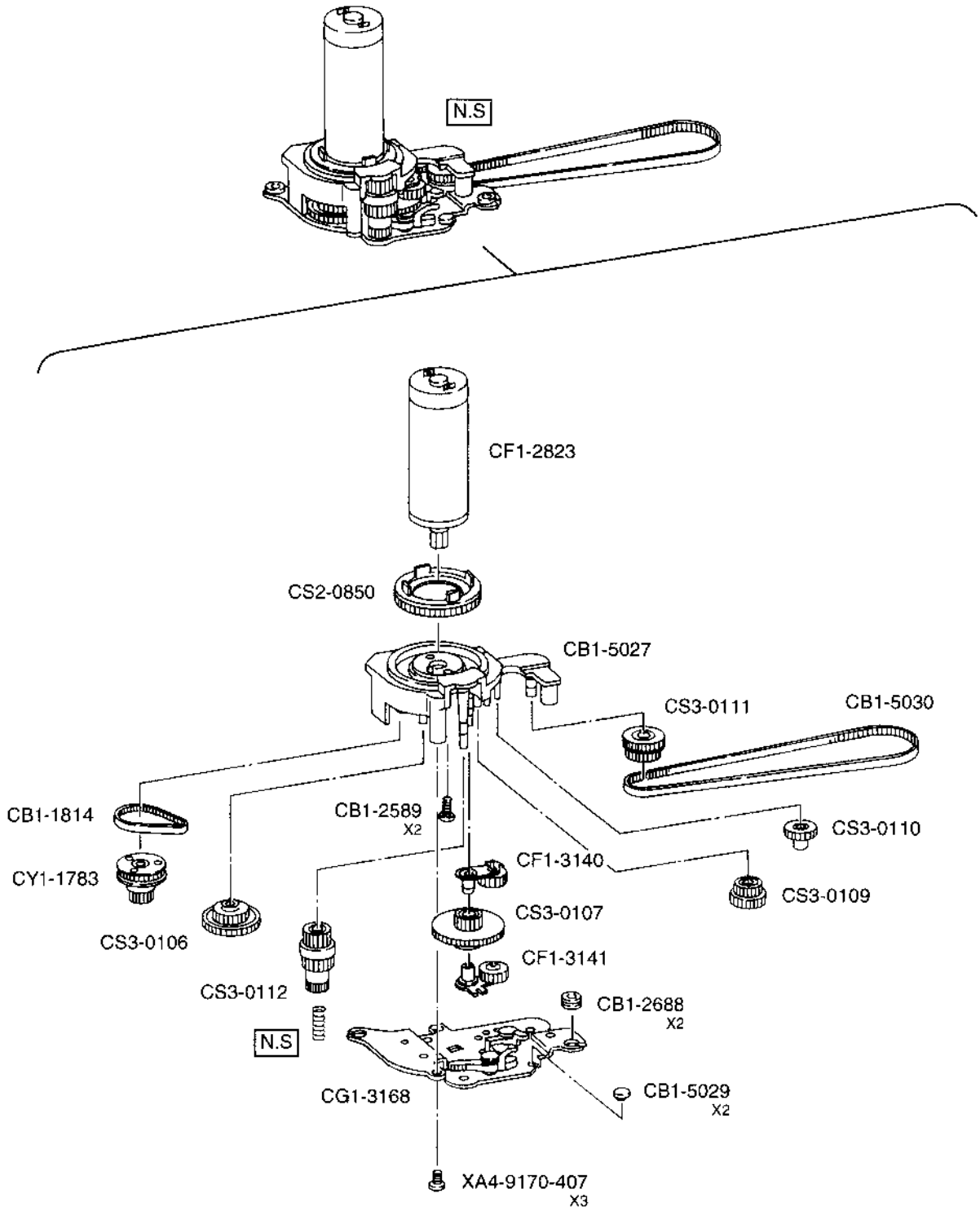

PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
C12-8286, 8287
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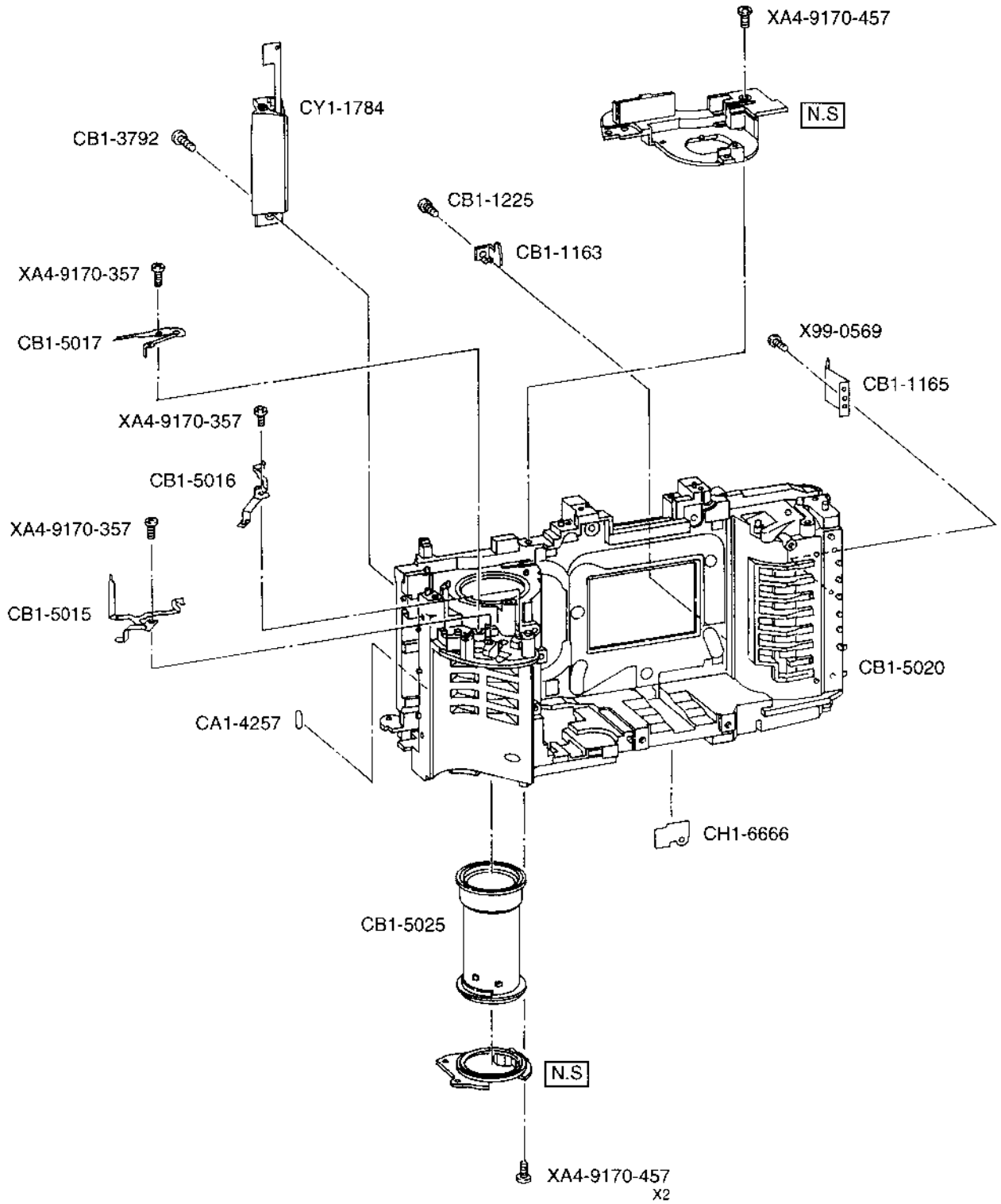
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CB1-1814-000	D	1	BELT, GEAR DRIVE	Pベルト
	CB1-2589-000		2	SCREW	
	CB1-2688-000	E	2	MOUNT, VIBRATION	ブッシュ
*	CB1-5027-000	E	1	HOUSING, GEAR	ギアボックス
*	CB1-5029-000	E	2	CUSHION	クッション
*	CB1-5030-000	D	1	BELT, GEAR DRIVE	巻き戻しベルト
	CF1-2823-000	D	1	MOTOR UNIT	モーターユニット
*	CF1-3140-000	E	1	ARM, 1ST PLANETARY	第一遊星アーム
*	CF1-3141-000	E	1	ARM, 2ND PLANETARY	第二遊星アーム
*	CG1-3168-000	E	1	BASE PLATE UNIT	下面地板ユニット
	CS2-0850-000	E	1	GEAR, SPOOL DRIVE	スプールギア
*	CS3-0106-000	E	1	GEAR, WIND 2	巻き上げギア2
*	CS3-0107-000	E	1	GEAR, SUN	太陽ギア
*	CS3-0109-000	E	1	GEAR, REWIND 1	巻き戻しギア1
*	CS3-0110-000	E	1	GEAR, REWIND 2	巻き戻しギア2
*	CS3-0111-000	E	1	GEAR, REWIND DRIVE	巻き戻しプーリー
*	CS3-0112-000	E	1	GEAR, SPOOL	スプール伝達ギア
*	CY1-1783-000	E	1	GEAR ASS'Y, 1ST WIND	巻き上げ第一ギア
	XA4-9170-407		3	SCREW	

CANON

EOS 55 — REF. C12-8281
ELAN 2 E / QD — C12-8283, 8284
EOS 50 E / QD — C12-8286, 8287
ELAN 2 / QD — C12-8293, 8294
EOS 50 / QD — C12-8296, 8297



PARTS LIST

REF.NO. C12-8281
C12-8283, 8284
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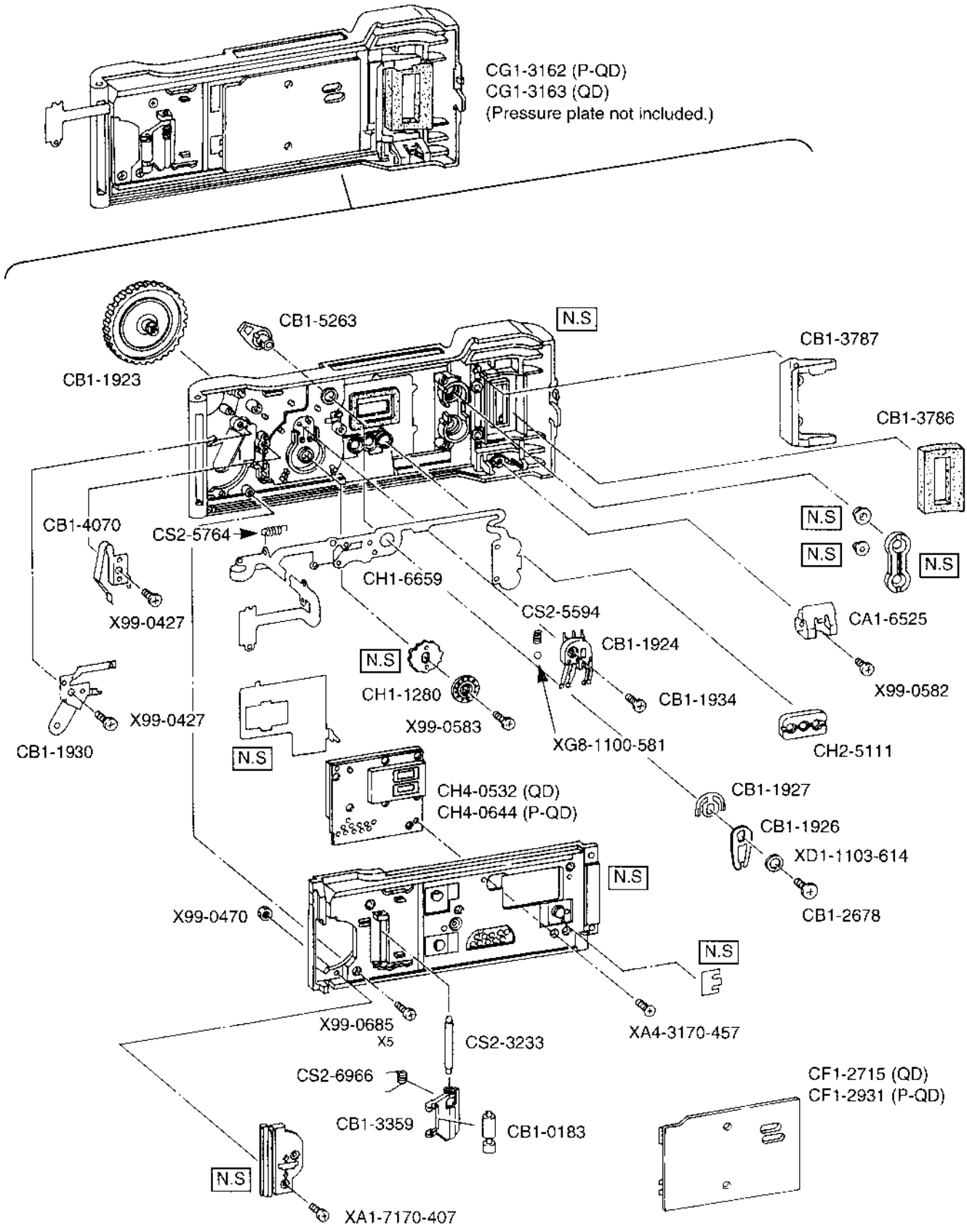
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA1-4257-000	E	1	SEAL, FILM	フィルム先端シール
	CB1-1163-000	E	1	JAW, FILM CARTRIDGE	パトローネアゴ
	CB1-1165-000	D	1	GUIDE, FILM CARTRIDGE	パトローネガイド
	CB1-1225-000		1	SCREW	
	CB1-3792-000		1	SCREW	
*	CB1-5015-000	E	1	CONTACT, BATTERY (-)	電池接片（一）
*	CB1-5016-000	E	1	CONTACT, BATTERY (+)	電池接片（十）
*	CB1-5017-000	E	1	CONTACT, RESET	リセットスイッチ接片
*	CB1-5020-000	E	1	BODY	本体
*	CB1-5025-000	D	1	SPOOL	スプール
*	CH1-6666-000	E	1	FPC, PANORAMA SWITCH	パノラマスイッチフレキ
*	CY1-1784-000	D	1	SIGNAL UNIT	信号ユニット
	X99-0569-000		1	SCREW	
	XA4-9170-357		3	SCREW	
	XA4-9170-457		3	SCREW	

CANON

EOS 55 — REF. C12-8281
ELAN 2 E QD — C12-8284
EOS 50 E QD — C12-8287
ELAN 2 QD — C12-8294
EOS 50 QD — C12-8297

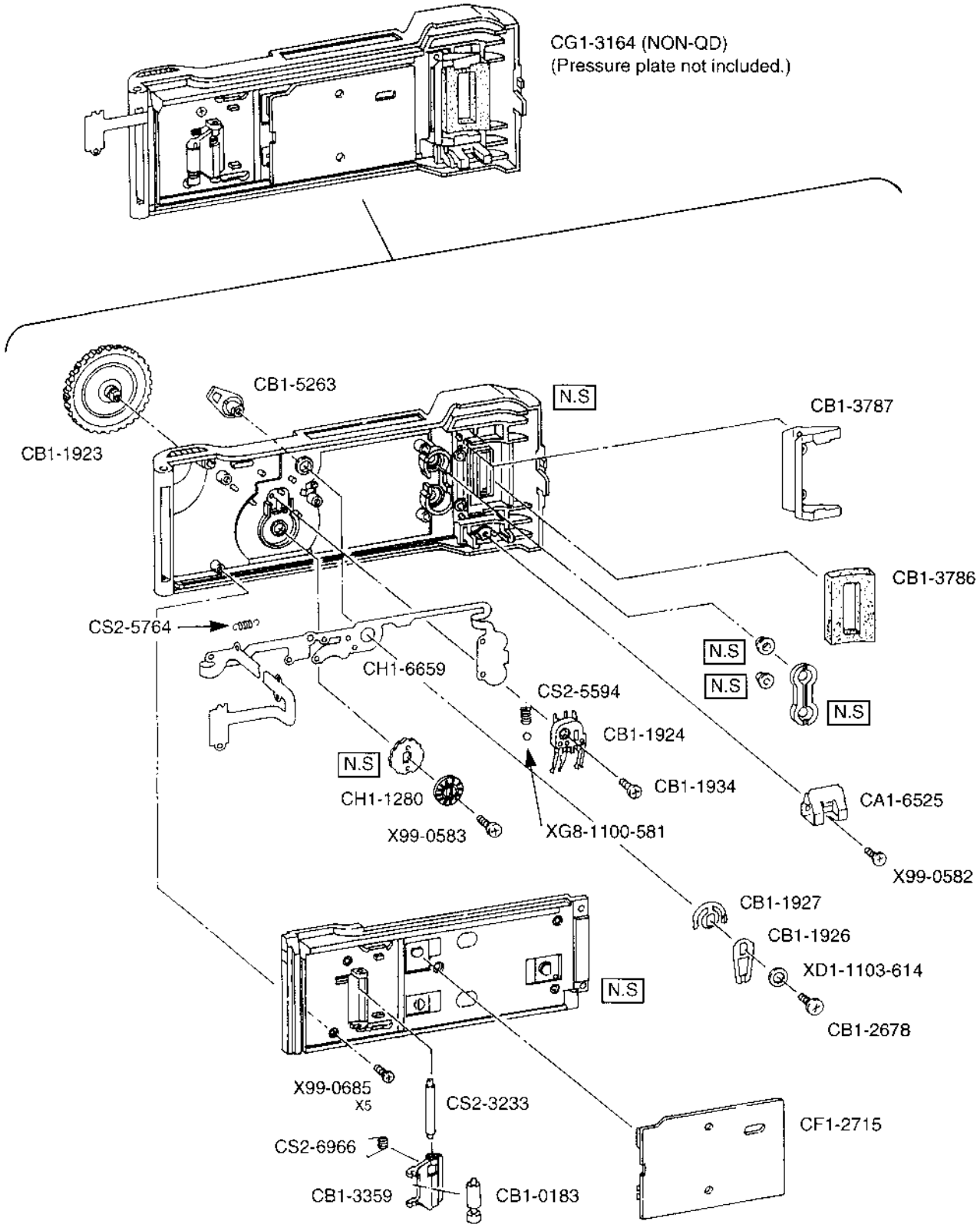


PARTS LIST

REF.NO. C12-8281
C12-8284
C12-8287
C12-8294
C12-8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA1-6525-000	E	1	SPRING, PLATE	パトローネ押上スプリング
	CB1-0183-000	E	1	ROLLER, BACK COVER GUIDE	背蓋ガイドローラー
	CB1-1923-000	D	1	DIAL, REAR INPUT	背蓋ダイヤル
	CB1-1924-000	E	1	CONTACT, DIAL	背蓋ダイヤル接片
	CB1-1926-000	E	1	DETENT, DIAL	ダイヤルクリック
	CB1-1927-000	E	1	CONTACT, DIAL LOCK SWITCH	ダイヤルロックスイッチ接片
	CB1-1930-000	E	1	CONTACT, DATE BATTERY (-)	デート電池接片（ー）
	CB1-1934-000		1	SCREW	
*	CB1-2678-000		1	SCREW	
	CB1-3359-000	E	1	HOLDER, ROLLER	背蓋可動レバー
	CB1-3786-000	D	1	SHIELD, LIGHT	フィルム窓モルトプレーン
	CB1-3787-000	E	1	SPRING, CARTRIDGE	パトローネ押さえ
	CB1-4070-000	E	1	CONTACT, DATE BATTERY (+)	デート電池接片（＋）
*	CB1-5263-000	E	1	KNOB, DIAL LOCK SWITCH	ダイヤルロックスイッチ
	CF1-2715-000	D	1	PLATE, PRESSURE (QD)	圧板ユニット（QD）
	CF1-2931-000	D	1	PLATE, PRESSURE (PANORAMA)	圧板ユニット（パノラマ）
*	CG1-3162-000	D	1	BACK COVER UNIT (PANORAMA)	パノラマ背蓋ユニット
*	CG1-3163-000	D	1	BACK COVER UNIT (QD)	QD背蓋ユニット
	CH1-1280-000	E	1	PCB, REAR DIAL	ダイヤル基板
*	CH1-6659-000	E	1	FPC, BACK	背蓋フレキ
	CH2-5111-000	E	1	SWITCH, DATE	デートスイッチ
	CH4-0532-000	D	1	PCB ASS'Y, DATE (QD)	デートモジュール
*	CH4-0644-000	D	1	PCB ASS'Y, DATE (PANORAMA)	パノラマデートモジュール
	CS2-3233-000	E	1	SHAFT, ROLLER HOLDER	ローラー軸
	CS2-5594-000	E	1	SPRING, COIL	クリックスプリング
*	CS2-5764-000	E	1	SPRING, COIL	フレキスプリング
	CS2-6966-000	E	1	SPRING, TORSION	ローラースプリング
	X99-0427-000		2	SCREW	
	X99-0470-000		1	NUT	六角ナット
	X99-0582-000		1	SCREW	
	X99-0583-000		1	SCREW	
	X99-0685-000		5	SCREW	
	XA1-7170-407		1	SCREW	
	XA4-3170-457		1	SCREW	
	XD1-1103-614		1	WASHER	ワッシャー
	XG8-1100-581		1	BALL	ボール

CANON ELAN 2 E REF. C12-8283
EOS 50 E C12-8286
ELAN 2 C12-8293
EOS 50 C12-8296



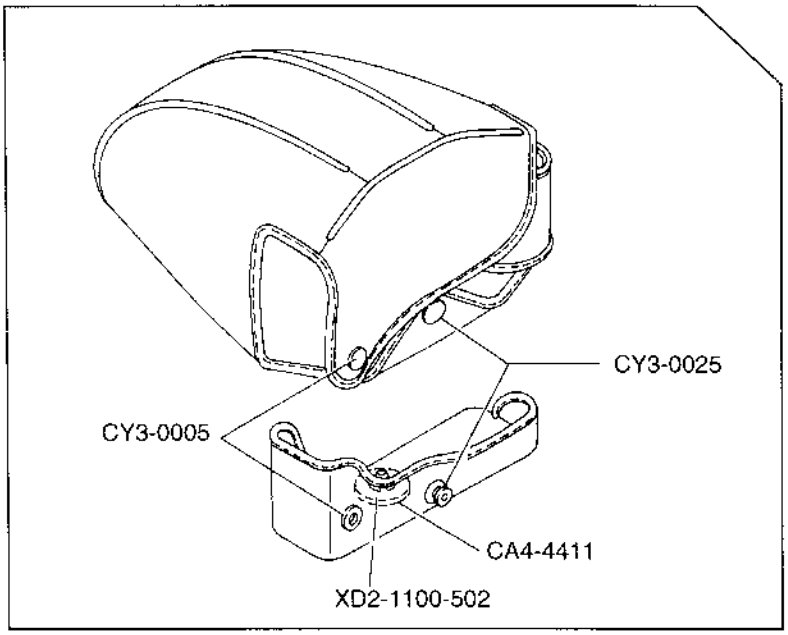
PARTS LIST

REF.NO. C12-8283
C12-8286
C12-8293
C12-8296

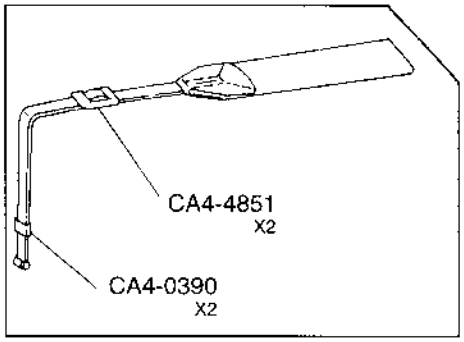
NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA1-6525-000	E	1	SPRING, PLATE	パトローネ押上スプリング
	CB1-0183-000	E	1	ROLLER, BACK COVER GUIDE	背蓋ガイドローラー
	CB1-1923-000	D	1	DIAL, REAR INPUT	背蓋ダイヤル
	CB1-1924-000	E	1	CONTACT, DIAL	背蓋ダイヤル接片
	CB1-1926-000	E	1	DETENT, DIAL	ダイヤルクリック
	CB1-1927-000	E	1	CONTACT, DIAL LOCK SWITCH	ダイヤルロックスイッチ接片
	CB1-1934-000		1	SCREW	
*	CB1-2678-000		1	SCREW	
	CB1-3359-000	E	1	HOLDER, ROLLER	背蓋可動レバー
	CB1-3786-000	D	1	SHIELD, LIGHT	フィルム窓モルトプレーン
	CB1-3787-000	E	1	SPRING, CARTRIDGE	パトローネ押さえ
*	CB1-5263-000	E	1	KNOB, DIAL LOCK SWITCH	ダイヤルロックスイッチ
	CF1-2715-000	D	1	PLATE, PRESSURE (QD)	圧板ユニット（QD）
*	CG1-3164-000	D	1	BACK COVER UNIT (NON-QD)	ノーマル背蓋ユニット
	CH1-1280-000	E	1	PCB, REAR DIAL	ダイヤル基板
*	CH1-6659-000	E	1	FPC, BACK	背蓋フレキ
	CS2-3233-000	E	1	SHAFT, ROLLER HOLDER	ローラー軸
	CS2-5594-000	E	1	SPRING, COIL	クリックスプリング
*	CS2-5764-000	E	1	SPRING, COIL	フレキスプリング
	CS2-6966-000	E	1	SPRING, TORSION	ローラースプリング
	X99-0582-000		1	SCREW	
	X99-0583-000		1	SCREW	
	X99-0685-000		5	SCREW	
	XD1-1103-614		1	WASHER	ワッシャー
	XG8-1100-581		1	BALL	ボール

CANON EOS 55, ELAN 2 E / QD, EOS 50 E / QD
ELAN 2 / QD, EOS 50 / QD
(ACCESSORY)

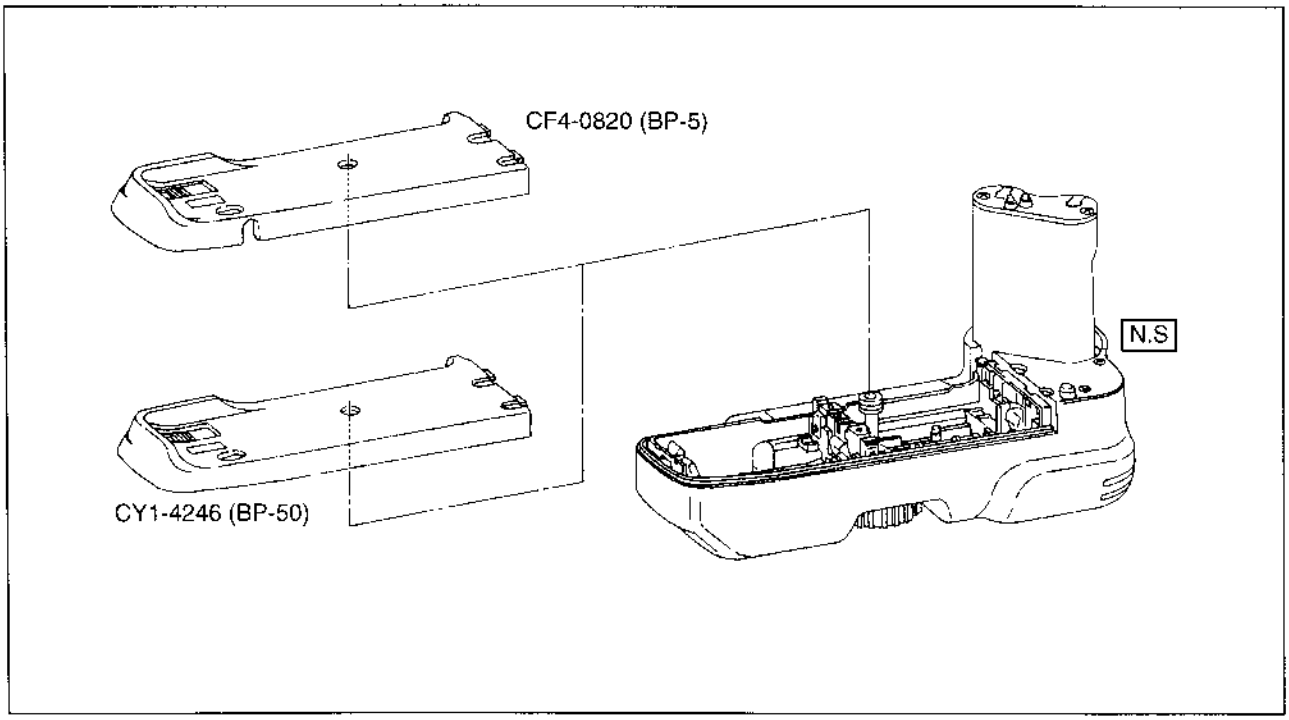
C46-1922 SEMI HARD CASE EH9-L



C56-1641 WIDESTRAP
EW-100BB



C50-1901 BATTERY PACK BP-50



PARTS LIST

REF.NO. C12-8281
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C12-8286, 8287
C12-8293, 8294
C12-8296, 8297

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION	
	CA4-0390-000	E	2	LOOP	環
	CA4-4411-000	E	1	SCREW, TIGHTENING	締め付けビス
	CA4-4851-000	E	2	CLASP	止め金
	CY3-0005-000	E	1	HOOK	ホック
	CY3-0025-000	E	1	HOOK	ホック
	XD2-1100-502		1	E RING	

REF.NO. C50-1901 BATTERY PACK BP-50

NEW	PARTS NO.	CLASS	QTY	DESCRIPTION
*	CF4-0820-000	D	1	COVER ASS'Y, BATTERY (BP-5)
*	CY1-4246-000	D	1	COVER ASS'Y, BATTERY (BP-50)

ELECTRIC PARTS LIST

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NEW	SYMBOL	PARTS NO.	DESCRIPTION	REMARK	PAGE
	LCD DR.	CH4-0587-000	LCD DRIVER		
		Y11-3701-000	LEAD	WHITE	
		Y11-3702-000	LEAD	BLACK	
		Y11-3703-000	LEAD	RED	
		Y11-3706-000	LEAD	ORANGE	
		Y11-3711-000	LEAD	BLUE	
		Y11-3714-000	LEAD	GLAY	
		Y11-3901-000	LEAD	WHITE	
		Y11-3902-000	LEAD	BLACK	
		Y11-3903-000	LEAD	RED	
		Y11-3904-000	LEAD	PINK	
		Y11-3906-000	LEAD	ORANGE	
		Y11-3907-000	LEAD	YELLOW	
		Y11-3909-000	LEAD	GREEN	
		Y11-3911-000	LEAD	BLUE	
		Y11-3912-000	LEAD	PURPLE	
		Y11-3913-000	LEAD	BROWN	
		Y11-4402-000	LEAD	BLACK	
		Y11-4403-000	LEAD	RED	
		Y11-4404-000	LEAD	PINK	
		Y11-5001-000	LEAD	WHITE	
		Y11-5002-000	LEAD	BLACK	
		Y11-5003-000	LEAD	RED	

INDEX OF PARTS LIST

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NEW	PARTS NO.	PAGE	NEW	PARTS NO.	PAGE
	CA1-3781-000	8		CB1-2636-000 (080)	7
	CA1-4257-000	11	*	CB1-2678-000	12, 13
	CA1-6504-040	2		CB1-2688-000	10
	CA1-6525-000	12		CB1-2689-000	9
	CA1-6525-000	13		CB1-2692-000	9
	CA1-7777-000	6		CB1-2738-000	7
	CA1-7780-000	6		CB1-3354-000	9
	CA1-7852-000	8		CB1-3355-000	9
	CA1-8666-050	2		CB1-3356-000	9
	CA1-9328-000	2		CB1-3357-000	9
	CA1-9408-000	1		CB1-3359-000	12, 13
	CA1-9427-000	1		CB1-3375-000	2
	CA4-0390-000	14		CB1-3376-000	2
	CA4-4411-000	14		CB1-3377-000	2
	CA4-4851-000	14		CB1-3407-000	9
	CB1-0183-000	12		CB1-3408-000	1
	CB1-0183-000	13		CB1-3443-000 (005)	6
	CB1-0276-000	1		CB1-3443-000 (010)	6
	CB1-1163-000	11		CB1-3443-000 (012)	6
	CB1-1165-000	11		CB1-3443-000 (015)	6
	CB1-1181-000	7		CB1-3443-000 (018)	6
	CB1-1225-000	11		CB1-3476-000	3
	CB1-1814-000	10		CB1-3786-000	12, 13
	CB1-1902-000	5		CB1-3787-000	12, 13
	CB1-1923-000	12, 13		CB1-3792-000	11
	CB1-1924-000	12, 13		CB1-4070-000	12
	CB1-1926-000	12, 13		CB1-4085-000	6
	CB1-1927-000	12, 13	*	CB1-5000-000	3
	CB1-1930-000	12	*	CB1-5001-000	3
	CB1-1934-000	12, 13	*	CB1-5003-000	1
	CB1-2032-000	8	*	CB1-5006-000	1
	CB1-2044-000	8	*	CB1-5010-000	1
	CB1-2580-000	1	*	CB1-5012-000	1
	CB1-2581-000	1	*	CB1-5013-000	9
	CB1-2589-000	10	*	CB1-5015-000	11
	CB1-2636-000 (030)	7	*	CB1-5016-000	11
	CB1-2636-000 (040)	7	*	CB1-5017-000	11
	CB1-2636-000 (050)	7	*	CB1-5020-000	11
	CB1-2636-000 (060)	7	*	CB1-5023-000	9
	CB1-2636-000 (070)	7	*	CB1-5025-000	11

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*	CB1-5027-000	10	*	CB1-5347-000	3
*	CB1-5029-000	10	*	CB1-5364-000	3
*	CB1-5030-000	10	*	CB1-5369-000	1, 2, 3
*	CB1-5038-000	5	*	CB1-5370-000	1
*	CB1-5040-000	2	*	CB1-5371-000	3
*	CB1-5053-000	4	*	CB1-5386-000	3
*	CB1-5063-000	7	*	CB1-5390-000	1
*	CB1-5064-000	7	*	CB1-6046-000	2
*	CB1-5066-000	7		CF1-2715-000	12, 13
*	CB1-5081-000	3		CF1-2763-000	8
*	CB1-5083-000	3		CF1-2764-000	8
*	CB1-5086-000	3		CF1-2823-000	10
*	CB1-5087-000	3		CF1-2931-000	12
*	CB1-5089-000	3	*	CF1-3129-000	1
*	CB1-5090-000	3	*	CF1-3130-000	6
*	CB1-5091-000	1	*	CF1-3140-000	10
*	CB1-5092-000	6	*	CF1-3141-000	10
*	CB1-5094-000	5	*	CF1-3143-000	4
*	CB1-5116-000	6	*	CF1-3144-000	6
*	CB1-5117-000	7	*	CF1-3146-000	6
*	CB1-5119-000 (005)	6	*	CF4-0820-000	14
*	CB1-5119-000 (010)	6	*	CG1-3144-000	5
*	CB1-5119-000 (012)	6	*	CG1-3147-000	9
*	CB1-5119-000 (015)	6	*	CG1-3149-000	5
*	CB1-5119-000 (020)	6	*	CG1-3151-000	5
*	CB1-5119-000 (025)	6	*	CG1-3153-000	9
*	CB1-5119-000 (030)	6	*	CG1-3154-000	5
*	CB1-5119-000 (035)	6	*	CG1-3155-000	8
*	CB1-5119-000 (040)	6	*	CG1-3156-000	8
*	CB1-5126-000	3	*	CG1-3157-000	9
*	CB1-5127-000	3	*	CG1-3158-000	4
*	CB1-5128-000	3	*	CG1-3161-000	4
*	CB1-5134-000	3	*	CG1-3162-000	12
*	CB1-5136-000	3	*	CG1-3163-000	12
*	CB1-5145-000	1	*	CG1-3164-000	13
*	CB1-5263-000	12, 13	*	CG1-3165-000	1
*	CB1-5342-000	7	*	CG1-3166-000	1
*	CB1-5343-000	7	*	CG1-3167-000	4
*	CB1-5344-000	7	*	CG1-3168-000	10
*	CB1-5346-000	3	*	CG1-3172-000	1

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*	CG1-3173-000	1		CS2-5656-000	3
*	CG1-3174-000	1	*	CS2-5764-000	12, 13
*	CG1-3175-000	1	*	CS2-6416-000	5
*	CG1-3176-000	4	*	CS2-6417-000	5
*	CG1-3177-000	6	*	CS2-6421-000	7
*	CG1-3178-000	9	*	CS2-6422-000	7
*	CG1-3259-000	5		CS2-6966-000	12, 13
*	CG1-3262-000	1		CS2-7205-000	6
*	CG1-3263-000	1	*	CS3-0084-000	4
*	CG1-3264-000	1	*	CS3-0106-000	10
*	CG1-3265-000	1	*	CS3-0107-000	10
*	CG1-3266-000	1	*	CS3-0109-000	10
*	CG1-3267-000	1	*	CS3-0110-000	10
	CH1-1280-000	12, 13	*	CS3-0111-000	10
*	CH1-6658-000	2	*	CS3-0112-000	10
*	CH1-6659-000	12, 13	*	CS3-0114-000	5
*	CH1-6664-000	4	*	CS3-0115-000	5
*	CH1-6665-000	3	*	CS3-0118-000	5
*	CH1-6666-000	11	*	CS3-0119-000	5
*	CH1-6667-000	5	*	CS3-0121-000	6
*	CH1-6668-000	5	*	CS3-0122-000	2
*	CH1-6669-000	9	*	CS3-0123-000	2
*	CH1-6683-000	5		CY1-1280-000	6
*	CH1-6684-000	2	*	CY1-1774-000	2
*	CH1-6685-000	5	*	CY1-1775-000	5
	CH2-5111-000	12	*	CY1-1776-000	5
*	CH2-5140-000	1	*	CY1-1777-000	5
*	CH2-5172-000	1	*	CY1-1778-000	6
	CH4-0504-000	7	*	CY1-1779-000	7
	CH4-0532-000	12	*	CY1-1780-000	7
	CH4-0587-000		*	CY1-1781-000	7
*	CH4-0644-000	12	*	CY1-1782-000	7
*	CH5-0127-000	4	*	CY1-1783-000	10
*	CH6-2054-000	9	*	CY1-1784-000	11
*	CH9-0258-000	2	*	CY1-1785-000	1
	CS2-0850-000	10	*	CY1-1786-000	1
	CS2-3233-000	12, 13	*	CY1-4246-000	14
	CS2-5020-000	6		CY3-0005-000	14
	CS2-5507-000	1		CY3-0025-000	14
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	X99-0569-000	11		Y11-3714-000	
	X99-0582-000	12, 13		Y11-3901-000	
	X99-0583-000	12, 13		Y11-3902-000	
	X99-0685-000	12, 13		Y11-3903-000	
	X99-0699-000	1		Y11-3904-000	
	XA1-3170-507	2		Y11-3906-000	
	XA1-7170-407	2, 12		Y11-3907-000	
	XA4-3170-357	9		Y11-3909-000	
	XA4-3170-457	12		Y11-3911-000	
	XA4-4140-457	8		Y11-3912-000	
	XA4-6200-457	9		Y11-3913-000	
	XA4-6200-709	4		Y11-4402-000	
	XA4-9170-357	3, 11		Y11-4403-000	
	XA4-9170-359	5, 7		Y11-4404-000	
	XA4-9170-407	3, 4, 5, 10		Y11-5001-000	
	XA4-9170-409	4, 5, 6		Y11-5002-000	
	XA4-9170-457	9, 11		Y11-5003-000	
	XA4-9170-459	5		YN2-9160-000	7
	XA4-9170-507	1, 2, 3, 9	*	YN2-9185-000	6
	XA4-9170-557	6	*	YN2-9186-000	6
	XA4-9170-559	6	*	YN2-9236-000	6
	XA4-9170-707	4, 9	*	YN2-9243-000	3
	XA4-9200-459	2, 3			
	XA4-9200-557	9			
	XA4-9200-607	4			
	XA4-9200-709	4			
	XA4-9200-857	4			
	XA4-9200-909	4			
	XD1-1102-120	6			
	XD1-1102-121	6			
	XD1-1103-614	3, 12, 13			
	XD2-1100-132	3			
	XD2-1100-502	14			
	XG8-1100-581	12, 13			
	XG8-1100-602	3			
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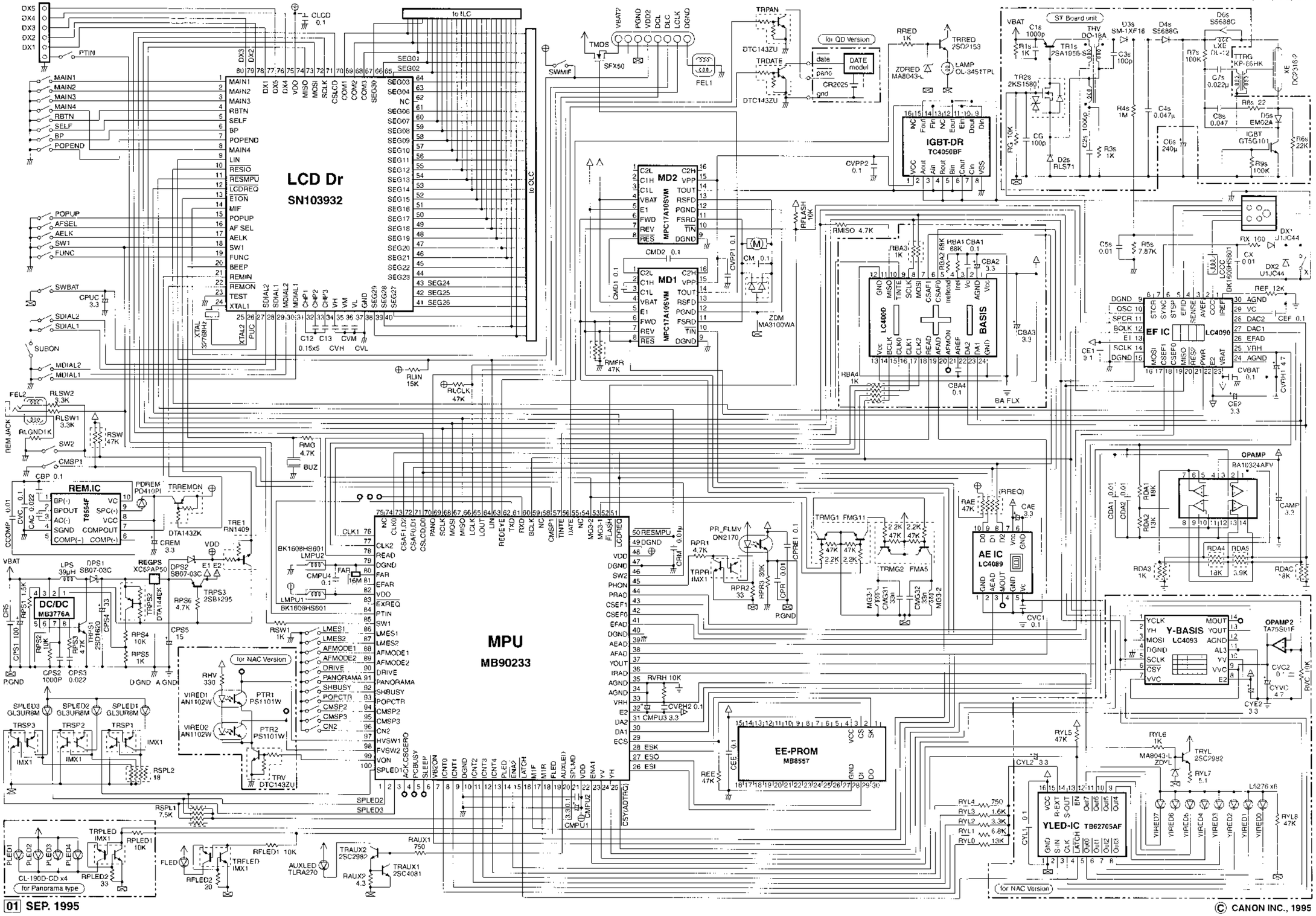
	Y11-3702-000				
	Y11-3703-000				
	Y11-3706-000				

Part 5

Electrical Diagrams

1. SCHEMATIC DIAGRAM

REF. NO. C12-8281, 83, 84, 86, 87, 93, 94, 96, 97



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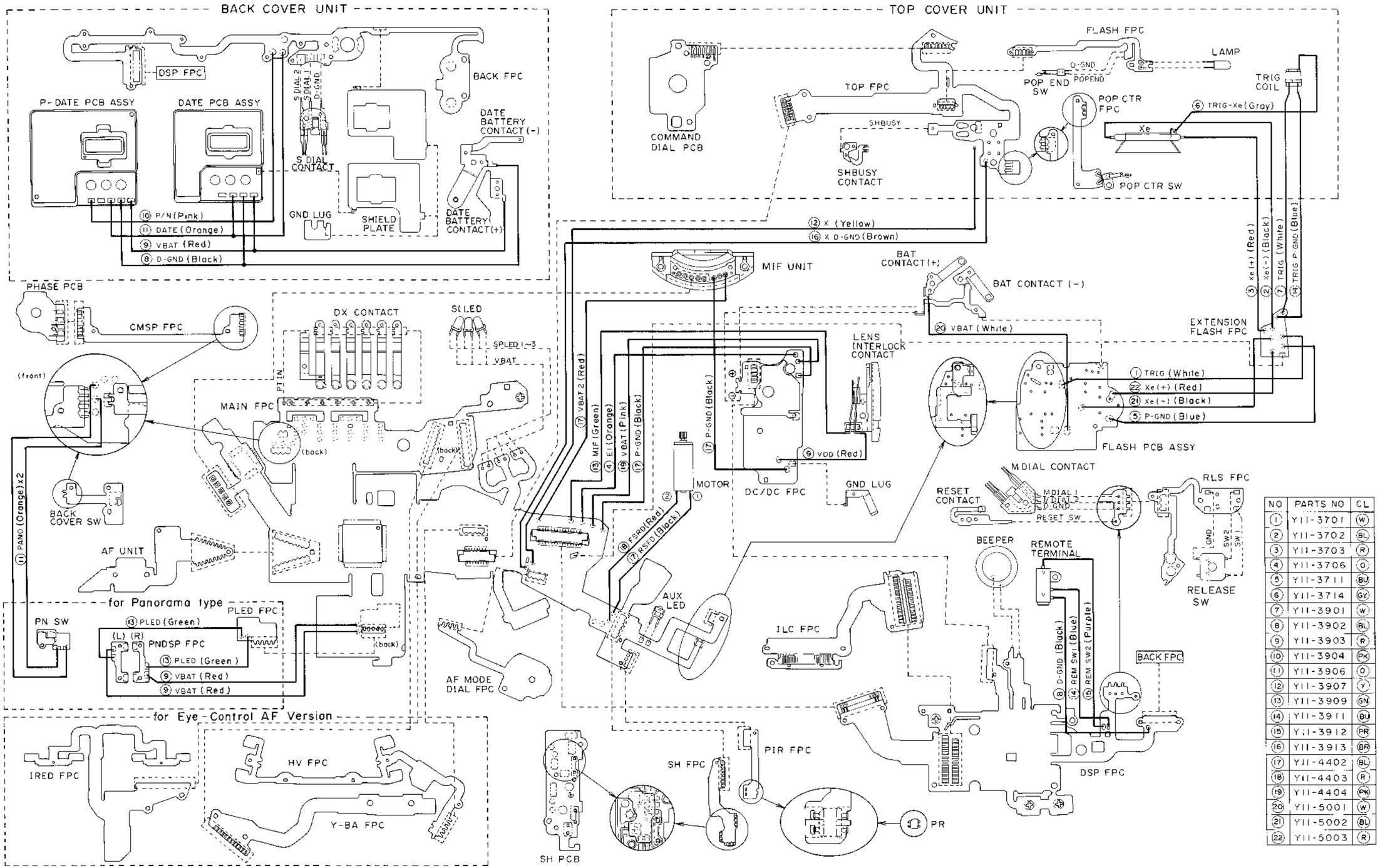

NO	PARTS NO	CL
①	YII-3701	(W)
②	YII-3702	(BL)
③	YII-3703	(R)
④	YII-3706	(O)
⑤	YII-3711	(BU)
⑥	YII-3714	(GY)
⑦	YII-3901	(W)
⑧	YII-3902	(BL)
⑨	YII-3903	(R)
⑩	YII-3904	(PK)
⑪	YII-3906	(O)
⑫	YII-3907	(Y)
⑬	YII-3909	(GN)
⑭	YII-3911	(BU)
⑮	YII-3912	(PR)
⑯	YII-3913	(BR)
⑰	YII-4402	(BL)
⑱	YII-4403	(R)
⑲	YII-4404	(PK)
⑳	YII-5001	(W)
㉑	YII-5002	(BL)
㉒	YII-5003	(R)

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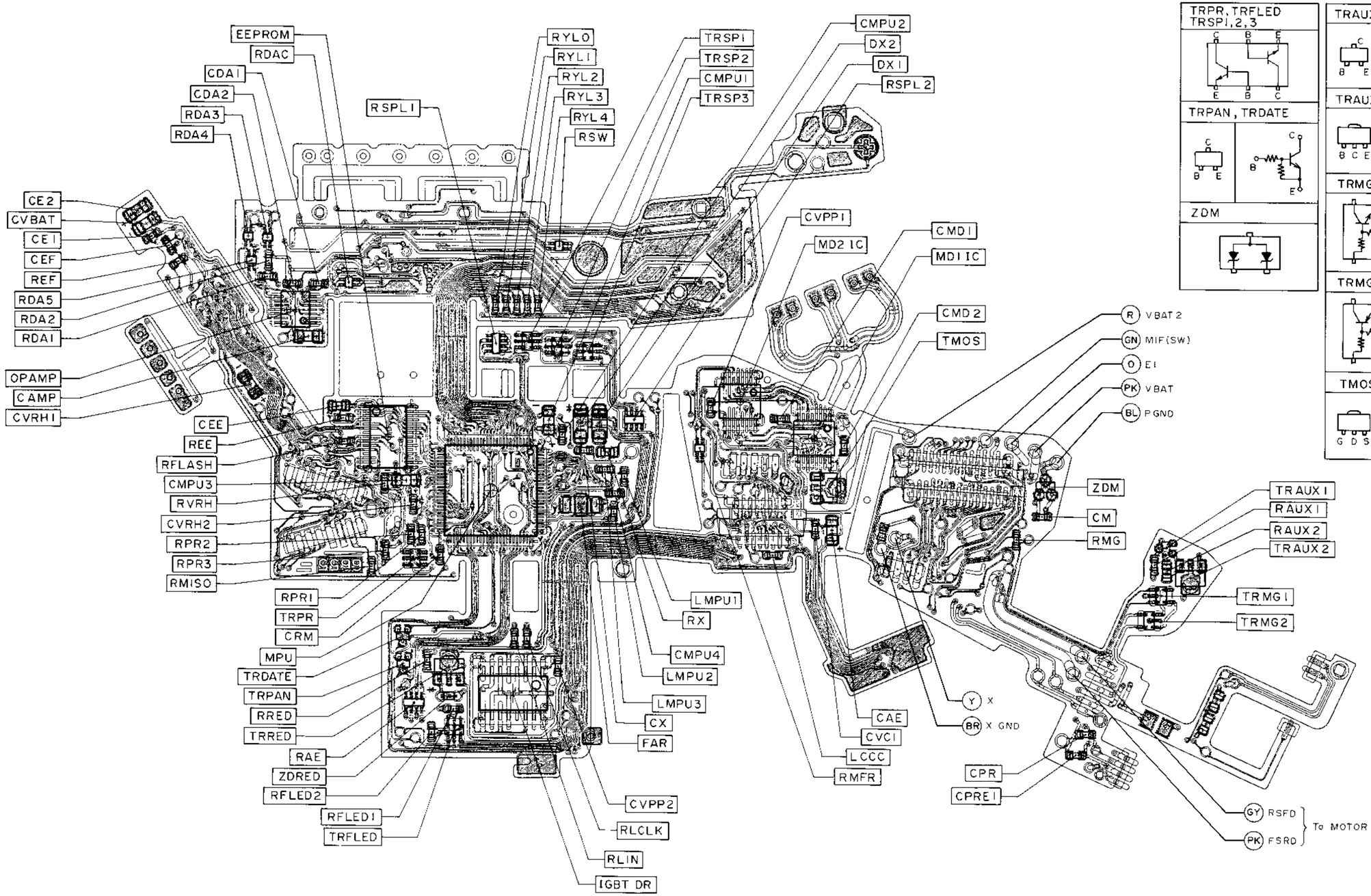
3. P.C.B. DIAGRAM
3.1-1 MAIN FPC

REF. NO. C12-8281,83,84,86,87,93,94,96,97



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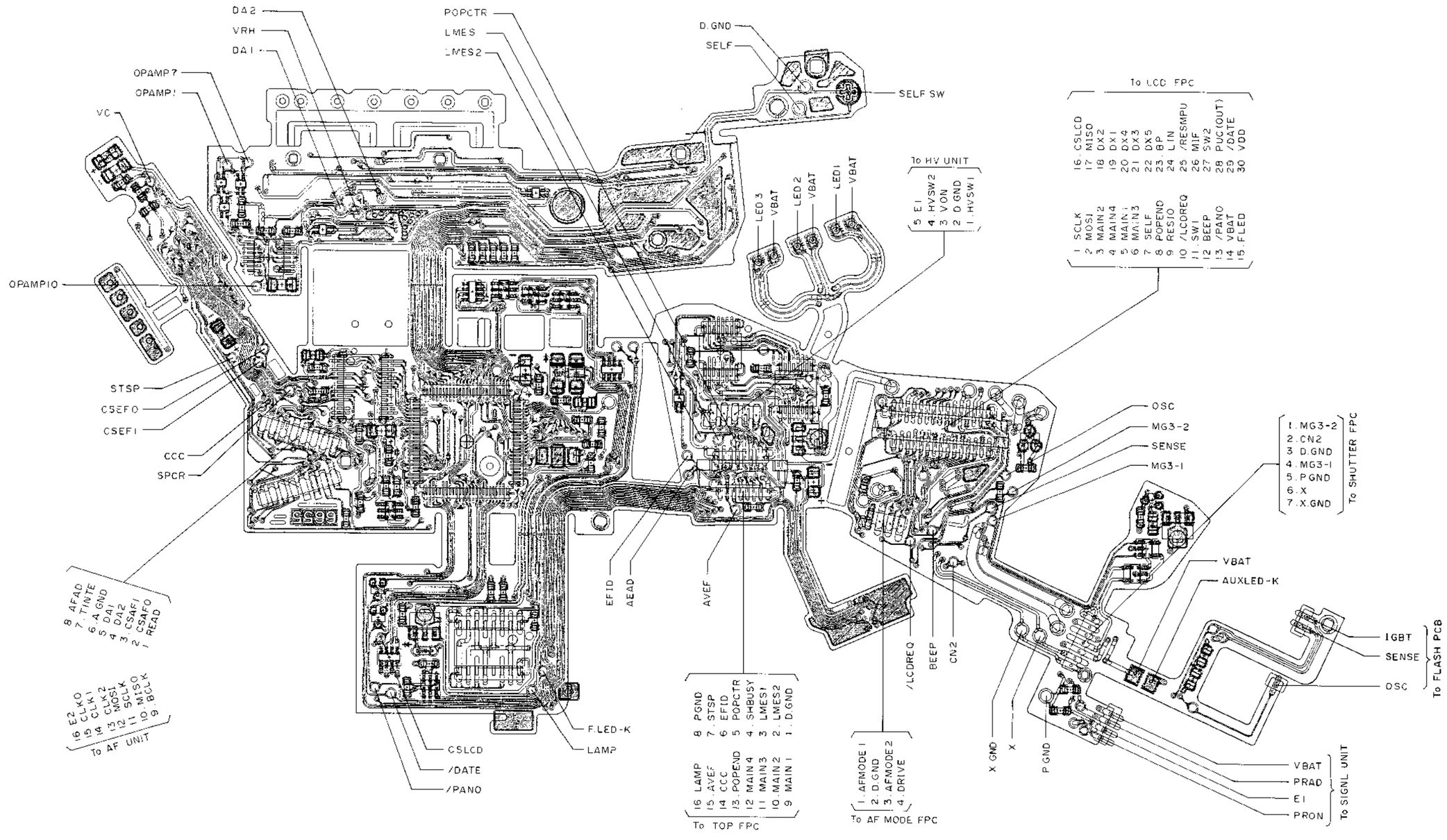

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3.1-3 MAIN FPC

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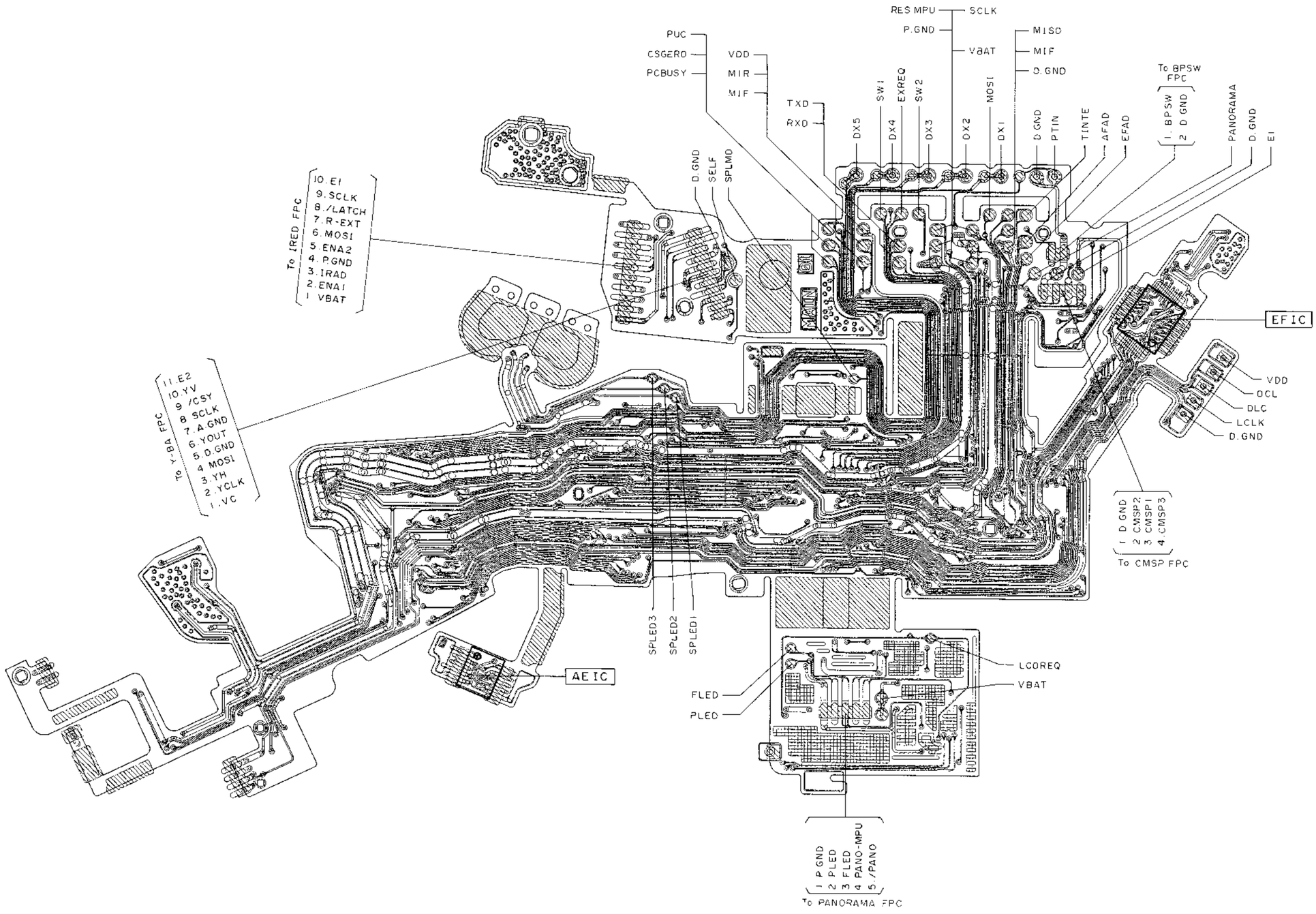

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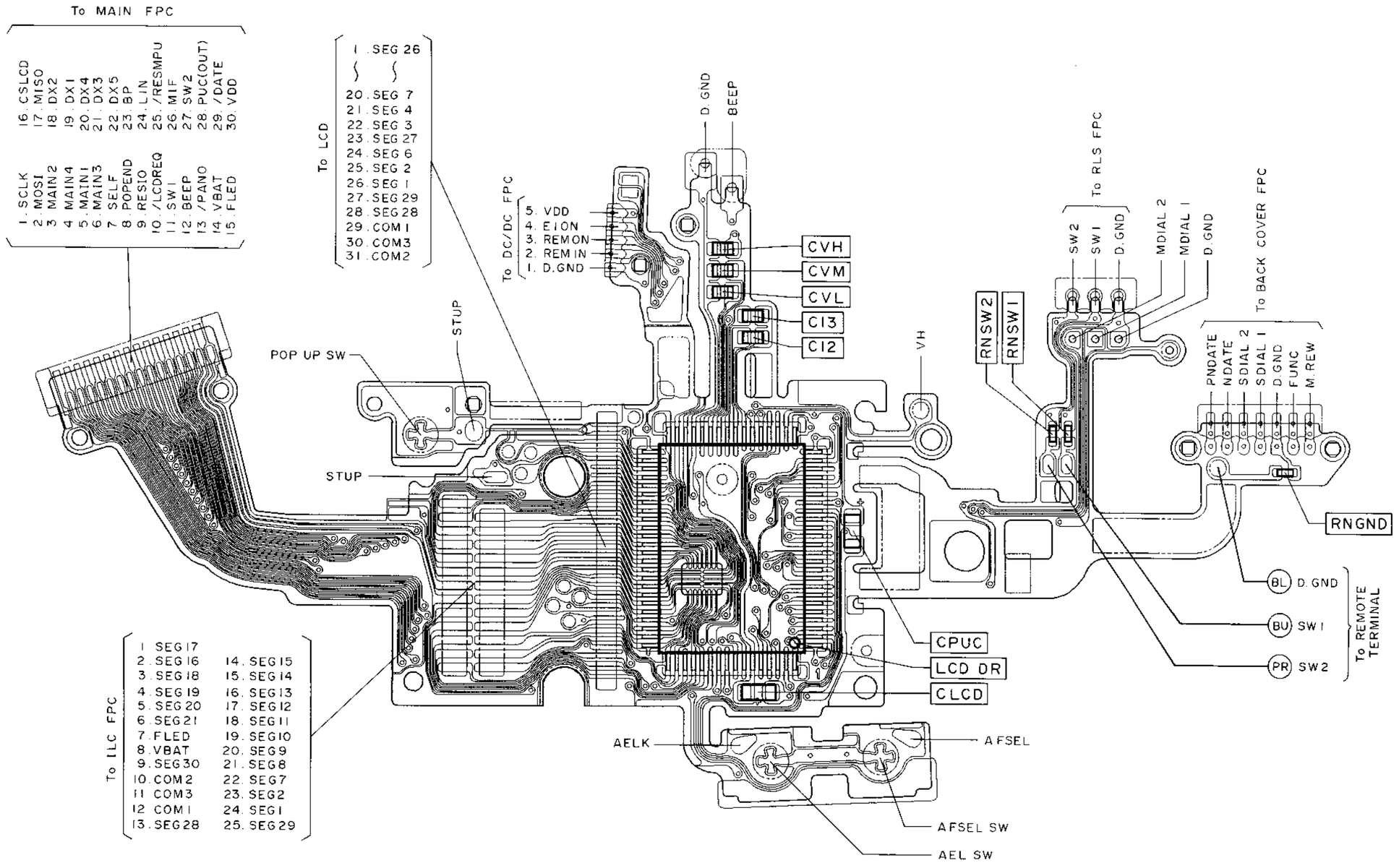

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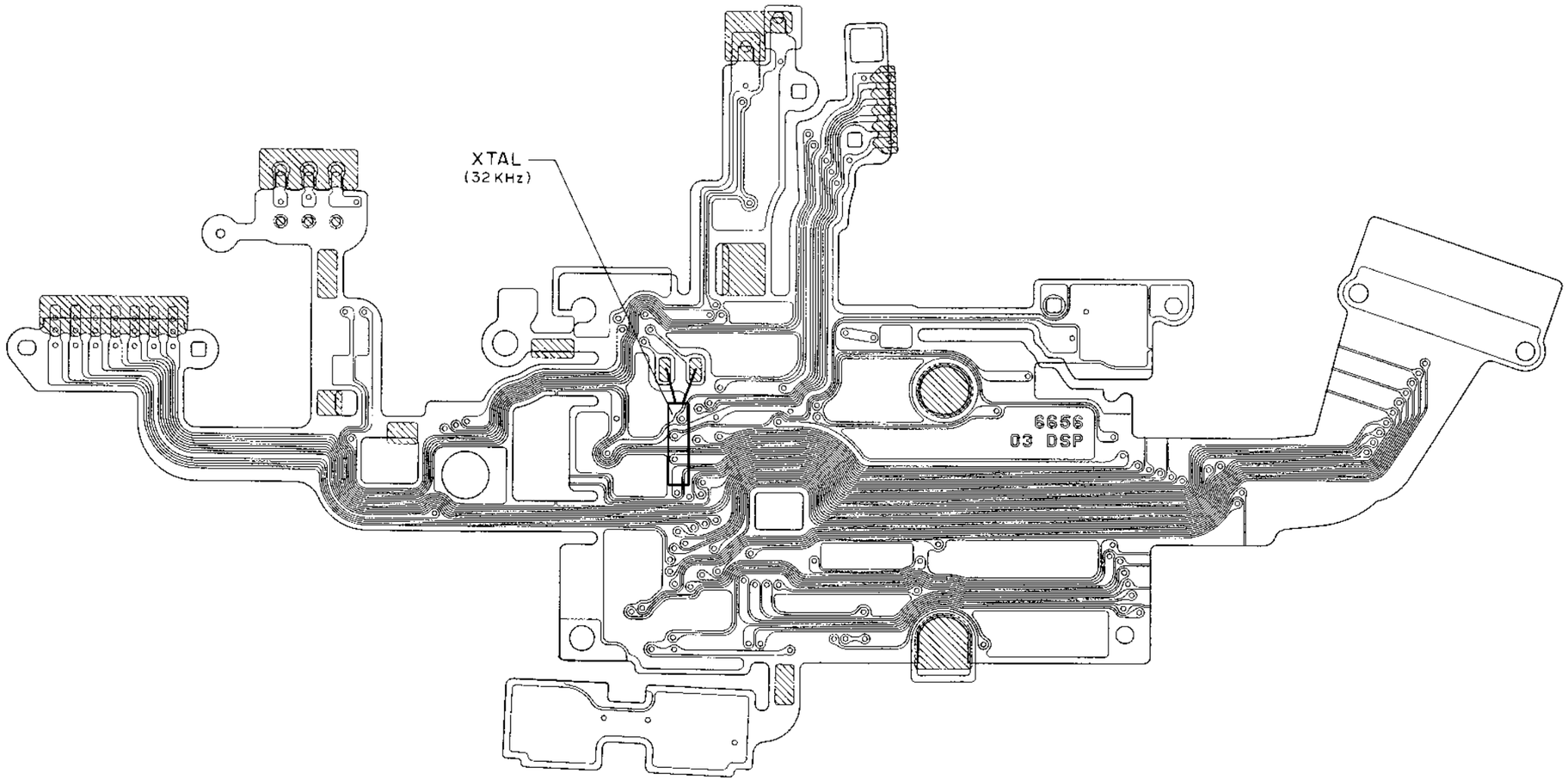
REF. NO. C12-8281,83,84,86,87,93,94,96,97



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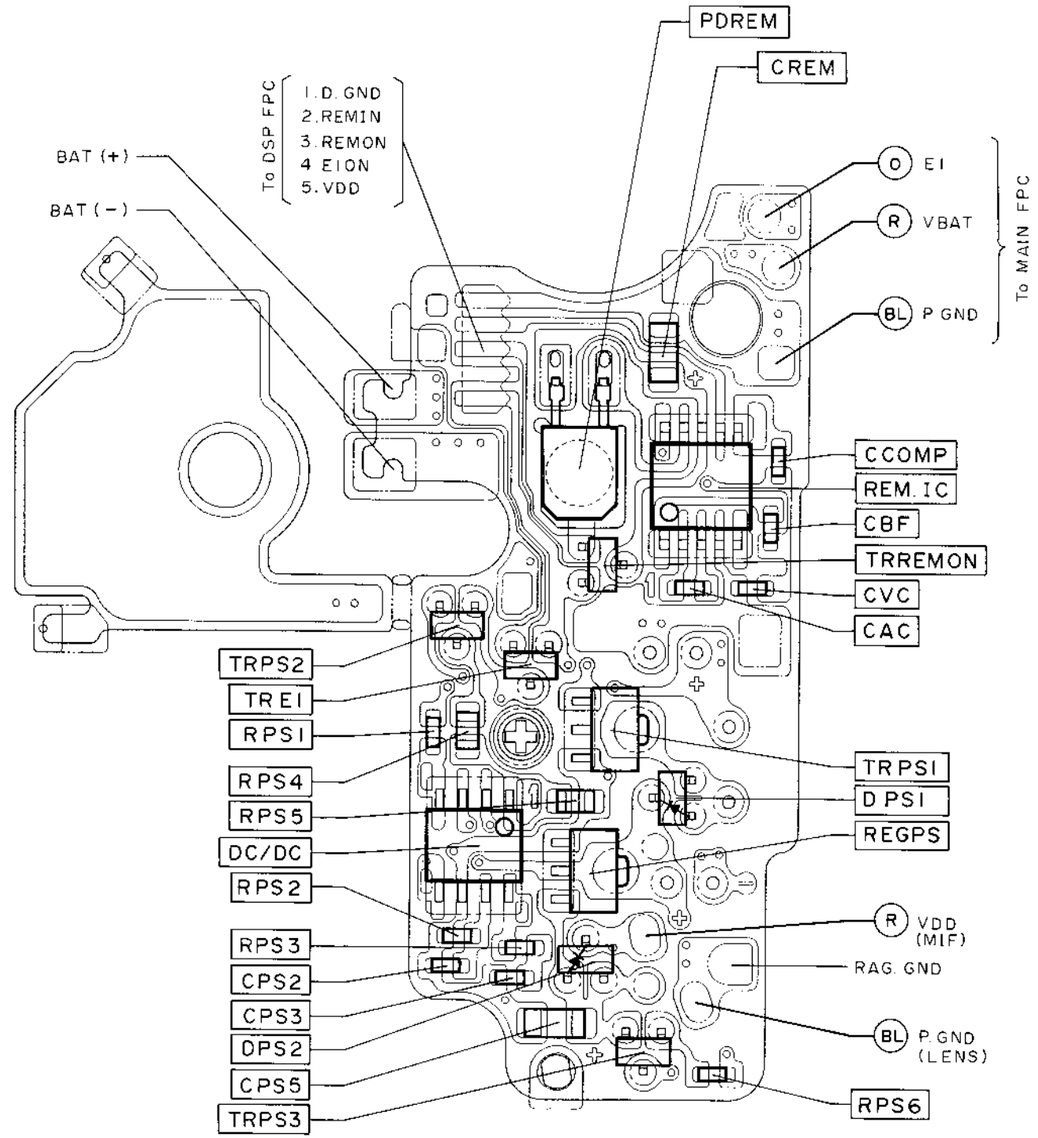

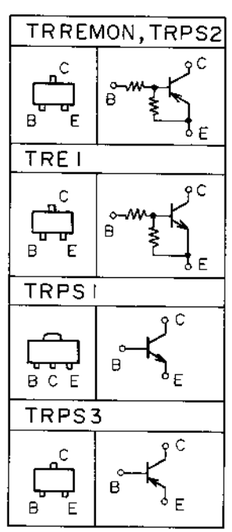

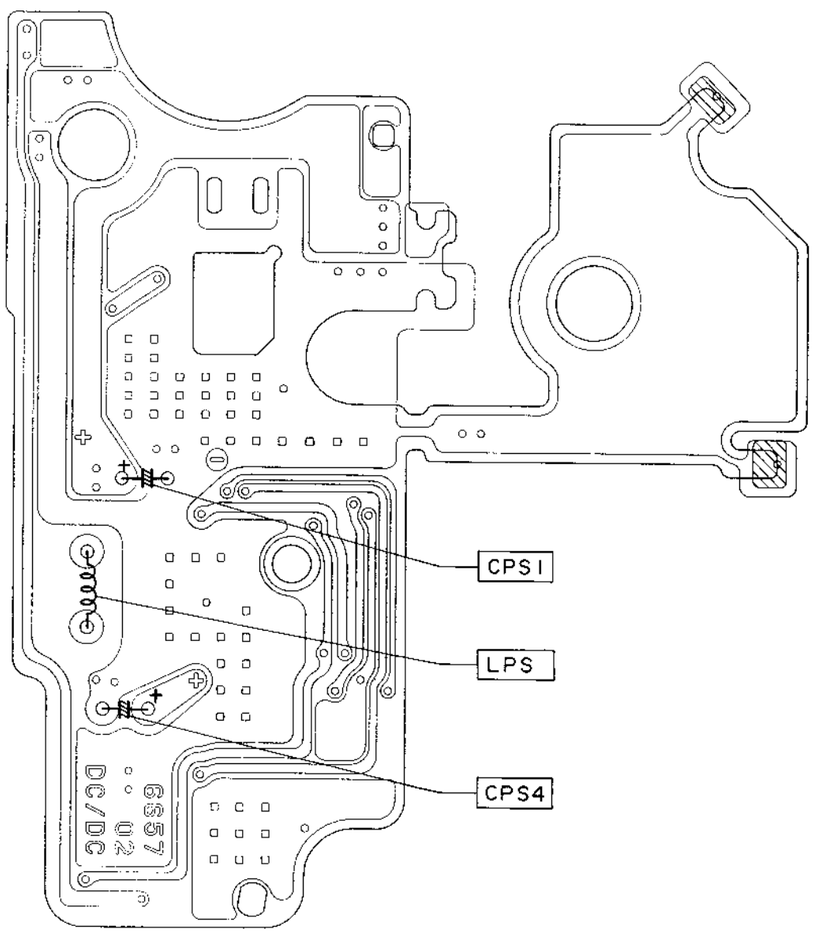

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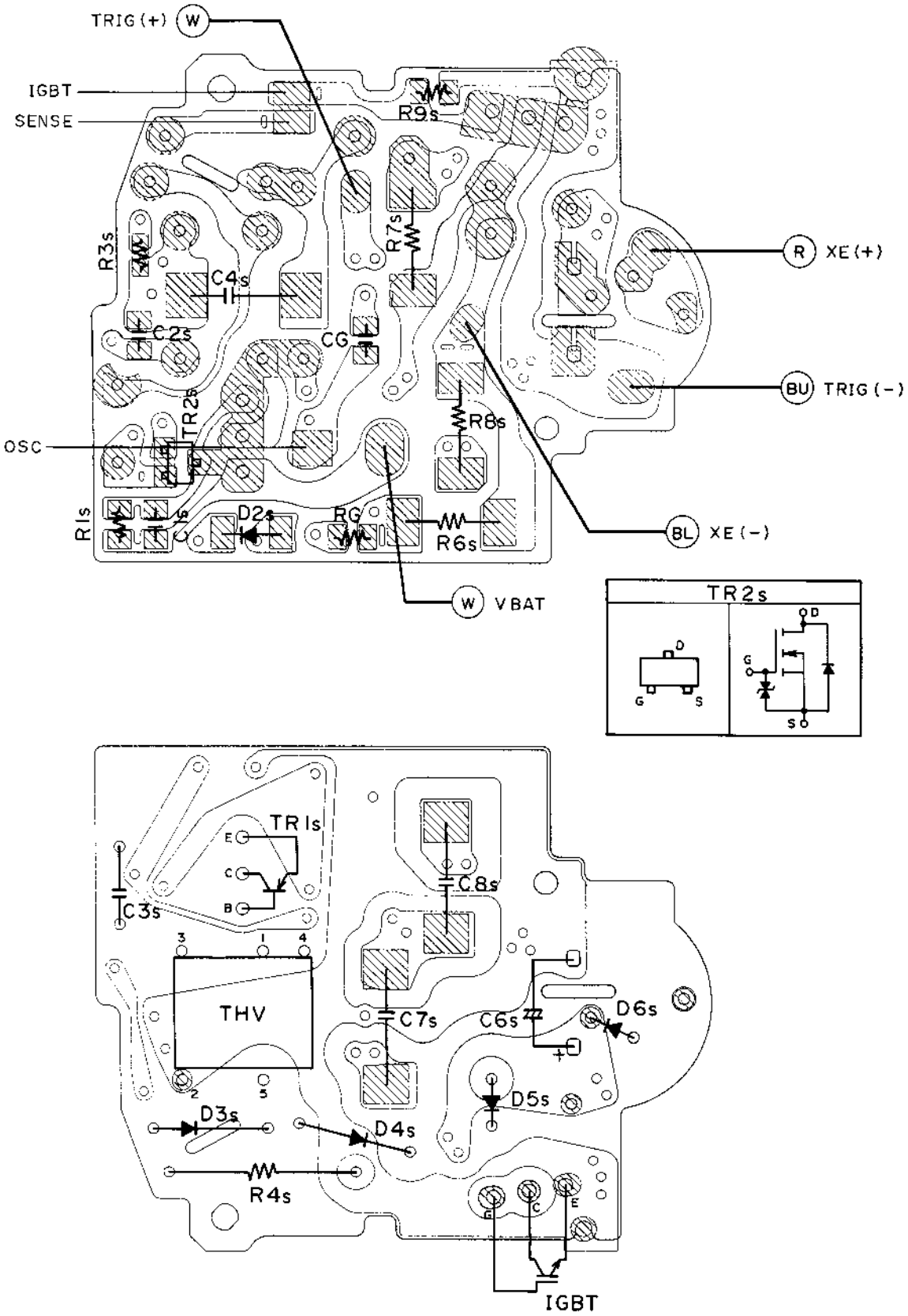
3.4 FLASH PCB

REF. NO. C12-8281,83,84,86, 87,93,94,96,97



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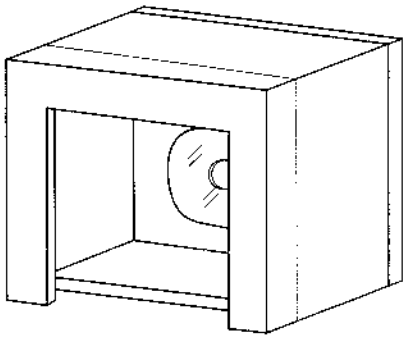
Appendix

Canon **TOOLS SPECIFICATION & INSTRUCTION** Report No.

Photo Products Quality Assurance Division,Canon Inc. **Date** 1995. Sept.

ORDER NO. CY9-1106-000 INST.NO.

NAME IRED Alignment Tool



Weight Approx. : 2540 (gr)

(W) (D) (H)

Volume : 36 X 20 X 32 (mm)

Used on :

C12-8281

C12-8283, 84

C12-8286, 87

1.Use

To adjust the IRED and Sensor Positon for Eye-Controlled Focus in the EOS 55, EOS ELAN II E, EOS 50 E.

2.Procedure

Refer to Service Manual (CY8-1200-139) .